Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

On leave granted, a vote of thanks was ordered to be tendered to Mr. I. W. Gregory, for the body of the Bengal tiger, presented this evening.

April 26*th*.

Vice-President Bridges in the Chair.

Forty members present.

The report of the Biological Department for the present month was read.

On report of the respective Committees, the following papers were ordered to be printed in the Proceedings:

Descriptions of Eight New Species of UNIONIDÆ, from Georgia, Mississippi, and Texas.

BY ISAAC LEA.

Unio spissus.—Testâ lævi, ellipticâ, subventricosâ, posticè obtusè angulatâ subæquilaterali; valvulis crassis; natibus prominulis; epidermide striatâ, rufo-fuscâ, obsoletè radiatâ; dentibus cardinalibus magnis, erectis, compressis, crenulatis, in utroque valvulo subduplicibus; lateralibus longis, crassis subcurvisque; margaritâ vel purpureâ vel salmonis colore tinctâ et iridescente.
Hab.—Satilla River, Wayne County, Georgia. T. C. Downie.

Unio corvus.—Testâ lævi, subtriangulari, subcompressâ, inæquilaterali, posticè obtusè biangulatâ; valvulis crassis, anticè crassioribus; natibus subprominentibus; epidermide nigricante, supernè glabrâ, politâ, infernè striatâ; dentibus cardinalibus subgrandibus, subconicis striatisque; lateralibus longis curvisque; margaritâ albâ et iridescente.
Hab.—Buckhead Creek, Burke County, Georgia. Bishop Elliott; and Ogeechee River, Georgia. Prof. Hanley.

Unio Burkensis.—Testâ lævi, transversâ, compressâ, ad latere planulatâ, inæquilaterali, posticè biangulatâ; valvulis crassiusculis; natibus prominulis; epidermide fusco-flavicante, micante et obsoletè radiatâ; dentibus cardinalibus breviusculis, compressis, acuminatis; lateralibus longis rectisque; margaritâ purpurascente et iridescente.
Hab.—Buckhead Creek, Burke County, Georgia. Bishop Elliott.

Unio aureus.—Testâ lævi, subtriangulari, compressâ, ad latere paulisper planulatâ, subinæquilaterali; valvulis subcrassis, anticè crassioribus; natibus subelevatis, ad apices acuminatis; epidermide aureâ, striatâ, obsoletè radiatâ; dentibus cardinalibus crassis, erectis, striatis, in utroque valvulo duplicibus; lateralibus curtis et obliquis; margaritâ albâ et iridescente.
Hab.—Texas. W. Newcomb, M. D.

Unio curtus.—Testâ lævi, obliquâ, ad umbones valdè tumidâ, anticè truncatâ, posticè obtusè angulata, valdè inæquilaterali; valvulis percrassis, anticè crassioribus; natibus elevatis, crassis, ferè terminalibus; epidermide tenebroso-castaneâ, ad apices virescente, obsoletè radiatâ; dentibus cardinalibus subgrandibus, compressis, acuminatis, obliquis; lateralibus crassis subcurvisque; margaritâ argenteâ et iridescente.
Hab.—Tombigbee River, Columbus, Mississippi. Wm. Spillman, M. D.

Unio permiscens.—Testâ lævi, obovatâ, inflatâ, posticè latè rotundatâ, valdè inæquilaterali; valvulis tenuibus; natibus prominulis; epidermide tenebroso-fuscâ, nigricante, obsoletè perradiatâ, nitidâ; dentibus cardinalibus parvulis, compressis, obliquis; lateralibus prælongis, lamellatis subcurvisque; margaritâ cæruleo-albâ et valdè iridescente.

Hab.—Tombigbee River, Columbus, Mississippi. Wm. Spillman, M. D.

MARGARITANA ELLIPTICA.—Testâ lævi, ellipticâ, subinflatâ, subæquilaterali, posticè obtusè angulatâ; valvulis tenuibus; natibus subprominentibus, ad apices subconcentricè undulatis; epidermide luteo-virente, glabrâ, nitidâ, perradiatâ; dentibus cardinalibus parvis, compressis, in utroque valvulo singulis; margaritâ cæruleo-albâ et iridescente.

Hab.—Tombigbee River, Columbus, Mississippi. Wm. Spillman, M. D.

ANODONTA TEXASENSIS.—Testâ lævi, ellipticâ, inflatâ, ad latere rotundâ, inæquilaterali, posticè subangulatâ; valvulis pertenuibus; natibus subprominentibus, ad apices biundulatâ; epidermide dilutè luteâ, glabrâ, fulgidâ, obsoletè radiatâ; margaritâ cæruleo-albâ, diaphanâ et valdè iridescente.

Hab.—Texas. W. Newcomb, M. D.

ICHTHYOLOGICAL NOTICES.

BY CHARLES GIRARD, M. D.

XLI. Since we are again called upon to mention the genus *Zygonectes*, we will venture to point out such structural peculiarities, as, in our opinion, may be considered its generical characters. Body rather slender and elongated, compressed, subfusiform in its profile, and covered with well developed scales. Head rather small, depressed, subpyramidal. Mouth very protractile, its gape being horizontal, whether in a protracted or a retracted condition. Teeth upon the premaxillar bones and upon the lower jaw; an external series slender and acerated, behind which may be observed a band of velvet-like ones. The origin of the anal fin is opposite the anterior margin of the dorsal, or in advance of it. The genus *Zygonectes* appears to be intermediate between *Hydrargyra* and *Gambusia*, resembling more the former by its general aspect, and the latter by its structure.

Specimens of a species of this genus, and which we call *Z. pulchellus*, were collected in Sugar Loaf Creek, Arkansas, by the party under Capt. A. W. Whipple. The largest one measures two inches and a half in total length, of which the head constitutes rather more than the fifth. The eye is large and circular; its diameter entering four times in the length of the side of the head. The dorsal and anal fins are deeper than long; the anal being larger than the dorsal, and placed more anteriorly, so that its anterior margin is nearly equidistant between the apex of the snout and the posterior margin of the caudal fin. The tip of the posterior rays of the dorsal extend as far as the insertion of the caudal, that is, a little further backwards than the tip of the posterior rays of the anal fin. The ventrals and the pectorals are but moderately developed; the tip of the former extends to the vent, whilst the latter do not quite reach the insertion of the ventrals. The rays of the various fins are as follows:—D 9; A 12; C 3, 1, 7, 6, 1, 3; V 6; P 13.—There are twelve longitudinal rows of scales between the anterior margin of the dorsal and that of the anal fin. The surface of the scales has a rather rugose appearance, owing to the conspicuousness of the concentric lines of growth. The scales themselves are deeper than long, anteriorly subtruncated or subconvex; undulating and rounded off upon the remaining edges.

The ground color is olivaceous brown, of a darker tint along the dorsal region than over the abdomen. A black band or streak extends from the nose, across the eye, along the middle of the flank to the base of the caudal fin. Small black dots, constituting four or five irregular longitudinal series, may be observed on either side of the dorsal region, above the lateral streak; the dorsal, anal, and caudal fins being likewise dotted with black, whilst the ventrals and pectorals are unicolor, like the abdomen.

XLII. Having had, recently, an opportunity of examining authentic specimens of either species of *Limia*, inhabiting the island of Cuba, and described by Prof. Poey, we are now better prepared to speak of those species which occur along our own shores and in the Mexican provinces bordering the Rio Grande Boundary.

And before we proceed any further into the history of these fishes, we deem it expedient to recapitulate the characters of that genus.

The body, generally speaking, is rather short and deep, very much compressed, and covered with comparatively large scales. The upper surface of the head is depressed, sloping forwards, wedge-shaped in general appearance. The mouth is small, or else, of moderate size, very protractile, directed upwards when in a retracted condition, the lower jaw then appearing longer than the upper; but when protracted, the aperture is directed horizontally forwards, and somewhat downwards, assuming the shape of a flattened (depressed) tube, the jaws being equal. Either jaw exhibits a row of slender, curved and acerated teeth, behind which a narrow patch of minute, velvet-like ones may be observed. The anal fin is inserted posteriorly to the anterior margin of the dorsal, and differently constructed according to the sexes. The dorsal fin itself is higher and longer in the male than in the female. The posterior edge of the caudal is subtruncated or rounded off.

In the above diagnosis of the generical characters to be assigned to *Limia*, it is easy to perceive a most intimate affinity between that genus and *Pœcilia*. Indeed, the only difference which is noticeable, resides in the structure of the anal fin of the male sex, which is narrower and deeper than in the female, and inserted more anteriorly, close to the ventrals; the anterior rays being much more developed than the posterior ones, which are partly atrophied. Now, such a distinction may not appear of sufficient importance, and ichthyologists might raise the question of preserving these two genera in the nomenclature. In the present state of our personal knowledge regarding these fishes, we should not have established a generic distinction upon that character alone. But, since these genera exist, we shall, for the present at least, speak of them under separate heads, leaving it with future investigations to decide upon their intrinsic value. Our reason for so doing is the lack of specimens of most of the species referred to the genus *Pœcilia*, in the "Histoire naturelle des Poissons," and described from specimens of the female sex alone. Moreover, we may expect many new species from Mexico and Central America, which may throw considerable light upon the natural history, yet so imperfectly known, of these little fishes.

We have examined specimens of *Pœcilia multilineata*, collected at Palatka, East Florida, by T. Glover. Lesueur himself admits their identity with those he obtained from Lake Ponchartrain. Not having at our command specimens of the latter locality, we are not prepared to express any opinion regarding that point. But we have had under examination from that locality, *Mollinesia latipinna*, which is considered now as the male sex of *Pœcilia multilineata*. These exhibit the same generical characters which we have assigned to *Limia*; therefore, should further investigations corroborate a generic distinction between *Pœcilia* and *Limia*, the latter appellation will have to give way to *Mollinesia*, as having priority over it.

Male and female specimens of this same species were collected at Galveston, Texas, by Dr. C. B. R. Kennerly, under Capt. A. W. Whipple.

XLIII. The species which we have described under the name of *P. lineolata*, in the "Ichthyology of the U. S. and Mex. Boundary Survey," from specimens collected at Brownsville, near the mouth of the Rio Grande del Norte (Rio Bravo), belongs to the same genus as the former species. It is closely allied to *P. multilineata*, the female sex being compared, the male sex having not yet come under observations. It differs from the latter by a smaller head, a smaller eye, and a smaller mouth; the dorsal fin is also placed more anteriorly. The system of coloration being exactly the same in either species.

XLIV. The species which we have called *Limia pœciloides* is but very imperfectly characterised in the "Ichthyology of the U. S. and Mex. Boundary." Moreover, figs. 12—14, of plate xxxviii, do not belong to the same species. Hence the male sex only is so far known; it is represented on the plate just alluded to, figs. 8—11.

Now then, if we recapitulate the characters to be assigned to this species, we shall have the following diagnosis:—The back is arched and the abdomen quite convex; the greatest depth taken in advance of the anterior edge of the dorsal fin enters somewhat less than four times in the total length. The head is contained four times and a half in the total length; external series of teeth very slender and exiguous. Diameter of eye entering three times and a half in the length of the side of the head. Dorsal fin nearly as long as deep, superiorly convex, its anterior margin being nearer the apex of the snout than the insertion of the caudal. The caudal itself is posteriorly rounded off or convex. The anal fin is inserted opposite the middle portion of the base of the dorsal. Ventrals small and slender, inserted immediately in advance of the anterior edge of the dorsal; their posterior extremity stretching beyond the anterior edge of the anal fin and overlap, consequently, the vent. The pectorals being rather short and broad, subelliptical in their outline. The rays are: D 13; A 6; C 2, 1, 7, 7, 1, 2; V 6; P 13.—The ground color is reddish-brown, with transverse narrow bands of a darker tint and a small blackish spot at the base of each scale, constituting about seven longitudinal series on either side of the body. The caudal fin is likewise transversely spotted, whilst the other fins are unicolor.

Specimens of this species were collected at Indianola, Texas, by John H. Clark, under Col. J. D. Graham.

XLV. A very pretty little species of *Limia*, which we call *L. formosa*, was likewise caught by John H. Clark, under Major Emory, in a lagoon at Paolo Alto. Of this, we have a specimen of either sex, the female differing widely from the male. We will proceed describing them, one after the other.

The male resembles somewhat the same sex in *L. pœciloides*, from which it may, however, be distinguished at first glance, by a greater depth at the peduncle of the tail. The back is likewise less arched, and the abdomen less convex; the greatest depth of the body, at the origin of the dorsal, entering somewhat over four times in the total length. The head constitutes about the fourth of the total length; the eye, which is large and circular, enters three times in the length of the side of the head by its diameter. The snout is rather abbreviated. The dorsal fin is longer than high, and convex or subconvex upon its upper margin. The caudal is rounded off posteriorly. The anal fin is inserted nearly opposite the anterior margin of the dorsal; it is slender and deep, but far from extending as far back as the posterior rays of the dorsal. The ventrals, which are slender, are inserted in advance of the anterior margin of the dorsal, at a short distance from the anal, between which there is just space enough for the anal aperture. Their extremities project beyond the base of the anal fin, particularly the second ray, which is longer than the rest. As to the pectorals, they are rather broad and proportionally well developed.

The female specimen, which measures one inch and a half, is more slender than the male. We take it, however, that when adult and full of roe, the proportions of the body may assume a different aspect. The greatest depth is equal to the length of the head, which constitutes the fourth of the total length. We notice the same abbreviated snout and large eyes, as in the male sex. The dorsal fin is nearly as high as long, and almost of equal depth throughout, its upper margin being straight or subconvex; the anterior margin of that fin is somewhat nearer the insertion of the caudal than the apex of the snout. The anal fin, which is deeper than long, is inserted opposite the posterior portion of the base of the dorsal. The ventrals are small, subtriangular when expanded, their posterior extremity not extending as far as the anterior edge of the anal. The pectorals are well developed, elongated, posteriorly rounded off, their extremities projecting beyond a line drawn at the origin of the ventrals. The rays of the fins are:—D 12; A 10; C 7, 1, 8, 7, 1, 6; V 6; P 9.—We have counted thirteen rays in the dorsal fin of the male sex, and seven in the anal. The structure of the latter is as follows:—First and second ray simple, short, and slender; third and fourth most developed, third one stoutest; fifth, sixth, and seventh slender, but deeper than the first and second, and bifurcated. The scales are very similar in either sex, much deeper than long, anteriorly truncated, with numerous radiating furrows upon the latter section only, and rounded off upon the remaining edges, with very fine concentric lines of growth. The ground color is olivaceous brown; the dorsal region assuming a darker tint, owing to a brown spot which may be observed on the scales, whilst the abdominal region has a lighter and more yellowish aspect. The dorsal fin alone exhibiting transverse series of blackish spots: the other fins being unicolor.

XLVI. Lieut. D. N. Couch has collected, in the waters of the Rio San Juan, at Cadarecta and Monterey, in the Province of New Leon, a species of *Limia*, which differs widely from its congeners, as will be shown presently. Unfortunately, all the specimens are of the female sex. The largest of these measure one and five-eighths of an inch, being apparently full grown, or, at any rate, adult, for the abdomen is distended by the presence of numerous embryos. The body appears to be rather short and contracted; the back being convex and gently sloping forwards. The head is small, constituting about the fifth of the total length. The orbit occupies the third of the side of the head. The dorsal fin is longer than high, superiorly subconvex, its anterior margin being nearer the insertion of the caudal than the apex of the snout. Its entire base is placed upon the posterior declivity of the back. The posterior margin of the caudal is, as usual, convex. The anal fin is inserted opposite the posterior portion of the base of the dorsal; it is narrow and rather deep, and its extremity extends further back than the posterior rays of the dorsal. The ventrals are comparatively of moderate size, sublanceolate, their extremity extending to the vent. As to the pectorals, they are narrow and elongated, rounded off posteriorly, not reaching a vertical line drawn at the insertion of the ventrals. The rays are:—D 9; A 6; C 4, 1, 9, 8, 1, 3; V 6; P 11.—The scales are very large, and exhibit the general structure alluded to in the other species. The dorsal region to the middle of the flanks is almost entirely chestnut-brown, so large are the spots which are observed on every scale. An obsolete band of black exists along the sides. The abdomen and inferior region of the tail are yellowish, with a golden reflect. The fins are unicolor, except the dorsal, which exhibits a few blackish spots. We call this species *Limia couchiana.*

XLVII. Another species of *Limia* appears to be common about Matamoras, where it was first collected by the late L. Berlandier, whose collection has since been purchased by Lieut. D. N. Couch, a lover and cultivator of natural sciences.

Specimens of the male sex measure nearly two inches in total length, of which the head, which is rather small, constitutes about the fifth part. The body is very much compressed, rather deep, maintaining its depth along the peduncle of the tail. The upper surface of the head, as usual, is very much depressed and flattened. The profile is gently sloping from the origin of the dorsal fin to the apex of the snout. The eye is well developed, subcircular, its diameter entering about three times in the length of the side of the head. The dorsal fin is longer than high, and equally elevated throughout its whole length, the tip of its posterior rays not extending as far as the insertion of the caudal fin. The anal is inserted somewhat posteriorly to the anterior margin of the dorsal, and close to the ventrals, from which it is separated by the anal aperture alone. The ventrals themselves are of moderate development, overlapping the vent and projecting beyond the insertion of the anal; the second ray is much longer than the rest. The pectorals are elongated, their tips extending beyond the insertion of the ventrals and the origin of the anal without reaching as far as the tip of the ventrals. The rays are :—D 14 ; A 7 ; C 5, 1, 9, 8, 1, 5; V 6; P 12.

The largest specimens of the female sex which have come under our observation, measure but an inch and a half. The general aspect of the body is the same as in the male sex; the head, however, is somewhat larger, being contained about four times and a half in the total length. The dorsal fin is much smaller than in the male, and convex upon its upper margin. The anal fin is rather small and inserted opposite the middle region of the dorsal. The ventrals overlap the vent, but their extremities do not quite reach the anterior margin of the anal. The tip of the pectorals extends beyond the origin of the ventrals, but not as far as the anal fin. The anal fin has nine rays. The second ray of the ventrals is even with the rest. The scales are large, much deeper than long, anteriorly subtruncated, and rounded off upon the rest of the periphery. Radiating furrows may be observed upon their anterior section only.

The ground color is reddish brown, lighter beneath than above, with longitudinal series of dark spots corresponding to the series of scales, and more conspicuous along the dorsal region than elsewhere. The dorsal fin is transversally barred with series of blackish spots, as well as the upper lobe of the caudal. The other fins being unicolor.

The above species we propose to designate under the name of *Limia matamorensis.*

XLVIII. A new genus to which we give the name of *Adinia*, has the general physiognomy of *Limia*, but differs from it, as well as from *Pœcilia*, by the structure of its mouth. The latter is protractile, rather cleft, nearly horizontal when retracted, and slightly directed downwards when protracted; the jaws being equal, the snout subconical, instead of being truncated as in *Limia* and *Pœcilia.* The lower jaw is also better developed than in the genera just alluded to, and the upper one is convex instead of being depressed. The male sex differs but little from the female; the dorsal and anal fins holding the same relative position in either of them,—being simply larger in the male than in the female. The posterior margin of the caudal fin is subtruncated.

Specimens of the typical species of this genus, and, as yet, the only one known, were collected at Galveston, Texas, by Dr. C. B. Kennerly, under Capt. A. W. Whipple, at St. Joseph's Island, Tex., by Gustavus Wurdemann, and at Indianola, Tex., by John H. Clark, under Col. J. D. Graham. The largest ones observed measure less than an inch and a half in total length, in which the head enters about three times and a half. The head is, therefore, well developed, wedge-shaped, the profile being quite declivous from the origin of the dorsal fin to the apex of the snout. The greatest depth of the body corresponds to the anterior margin of the dorsal, and diminishes rapidly backwards. The eye is large and circular, its diameter entering three times and a half in the length of the side of the head: once in advance of its anterior rim. The dorsal fin is higher than long, and quite elevated in the male sex; its anterior margin is nearly equidistant between the apex of the snout and the posterior edge of the caudal fin. The anal fin is deeper than long, and deeper in the male than in the female; its anterior margin corresponding to the middle of the base of the dorsal, and extends more backwards than the latter fin. Its exterior margin is rounded off, or convex. The ventrals are rather broad and overlap the vent, whilst the pectorals are elongated and extend beyond the origin of the ventrals. The second ray of the latter fins does not project beyond the others, as is the case with the species of *Limia.* The rays are:—D 9; A 11; C 4, 1, 8, 7, 1, 4 ; V 6 ; P 15.—The scales are somewhat deeper than long, anteriorly truncated and posteriorly rounded, whilst the upper and lower margins are nearly straight and parallel. The concentric lines of growth are very fine and numerous, and short radiating furrows occupy almost the entire anterior margin.

The dorsal region and upper surface of the head are greyish olive or olivaceous brown, with a darker line at the periphery of the scales. The flanks are fasciated alternatively with greyish brown and light yellowish transverse narrow bands, the more conspicuous as they approach the peduncle of the tail; the brown bands being wider than the light yellowish ones; there are however instances in which light streaks subdivide the brown bands. The opercular apparatus is silvery: the lower part of the head and the belly exhibiting a uniform light olivaceous or yellowish tint.

The name of *Adinia multifasciata* appears to us quite characteristic of the species which is here described. An immature female specimen is figured on Plate xxxviii, figs. 12–14 of the "Ichthyology of the U. S. and Mexican Boundary," where it is given as the female sex of *Limia pœciloides*, an error which we now rectify.

XLIX. Another new genus, which we call *Lucania*, has the general appearance of *Fundulus*, from which it differs by the presence, upon the jaws, of one row of teeth only; the mouth itself being fashioned as in *Fundulus:* the upper jaw being smaller and somewhat shorter than the upper, arched sideways and subdepressed superiorly. The head is somewhat rounded off and blunt. The insertion of the anal fin is more posteriorly than the dorsal. The caudal is rounded off. The scales are of but moderate development, deeper than long, with fine concentric striæ, and furrowed upon their anterior section. The sexes afford no greater differences than in *Fundulus* and *Hydrargyra.*

The typical species of the genus which is here instituted, was figured and described by us under the name of *Limia venusta* in the "Ichthyology of the U. S. and Mexican Boundary," plate xxxix, figs. 20—23, p. 71. Its present systematic name, therefore, will be *Lucania venusta.* Fig. 21 gives a most perfect idea of the shape and structure of the mouth. The lateral line is not always so conspicuous as represented in fig. 20. The teeth themselves are proportionally larger than in the following species. The anterior margin of the dorsal fin is nearly equidistant between the apex of the snout and the insertion of the caudal. The anal is placed opposite the posterior half of the dorsal, and consequently projects further back. The ventrals are slender, extending as far as the vent, and composed of six rays and not five, as formerly stated. The pectorals are elongated, posteriorly rounded off, and projecting beyond the insertion of the ventrals. The rays are:—D 13; A 11; C 3, 1, 8, 8, 1, 2; V 6; P 10.—The scales are deeper than long, anteriorly subtruncated, rounded off upon the remaining edges, with radiating furrows upon the anterior section only, the concentric lines of growth being very fine. The ground color is reddish brown, with groups of dark dots on the centre of the scales; the fins being unicolor, of a yellowish olive tint. A specimen of this species was collected at Indianola, Tex., by John H. Clark, under Col. J. D. Graham, while on the U. S. and Mexican Boundary Survey.

L. We find in the collection of the late L. Berlandier two specimens of a species of *Lucania*, collected in the neighborhood of Matamoras, resembling very closely the preceding one. The only differences which we are able to detect consist in a larger mouth and larger scales, a more backward position of the dorsal and anal, together with the following formula of the fins:—D 12; A 11; C 4, 1, 7, 7, 1, 3; V 6; P 12.—The coloration is the same. The specimens not being perfect, a further comparison could not be instituted. We shall designate them provisionally under the name of *Lucania affinis.*

LI. Amongst the fishes collected in the vicinity of the city of Mexico, by Maj.

W. Rich, in 1853, we notice a cyprinodont of a very peculiar external appearance, belonging nevertheless to the genus *Lucania*, as characterized above.

One of the female specimens measures two inches and a half in total length. The dorsal region is very much arched from the insertion of the dorsal fin to the nape, which is quite swollen. The head is rather small, constituting the fifth of the total length, its upper surface is subdepressed, the occipital region appearing concave from the sudden rising of the nape, a trait less conspicuous in smaller specimens of the same sex and in the males also. The snout is short, thick and blunt. The gape of the mouth is oblique upwards as in the other species of this genus. The eye is subcircular, its diameter entering three times and a half in the length of the side of the head. There are three slender branchiostegal rays on either side, the outermost being exiguous. The anterior margin of the dorsal fin is nearly equidistant between the apex of the snout and the posterior margin of the caudal fin; its upper margin is convex and its base is longer than the height of the middle rays. The caudal fin enters a little short of seven times in the total length. The anal is smaller than the dorsal, but has the same shape, and the same proportions between its base and its depth. Its anterior margin is placed posteriorly to that of the dorsal; the tip of its rays extending but very slightly further back than those of the latter,—so that the two fins are nearly even posteriorly. The ventrals are very small and reach the vent with their extremities. The pectorals are of moderate development, rounded off, not extending as far as the origin of the ventrals. The rays are :—D 20 ; A 23 ; C 5, 1, 10, 10, 1, 6 ; V 6 ; P 12.—The scales are comparatively small, deeper than long, subelliptical in their outline, exhibiting extremely fine concentric lines of growth, and provided with radiating furrows upon their anterior section alone. The ground color is olivaceous brown, with transverse dark brown bands which run occasionally together giving the entire body, head and fins, a greyish black appearance. Otherwise the fins assume a greyish olive tint.

The male sex is more slender than the female; the dorsal and anal fins being somewhat more developed, and the back less arched. The coloration is similar in either sex.

LII. In speaking of the generical characters to be assigned to *Girardinus*, and especially of the structure of the mouth, we ought to have stated that the latter is depressed, instead of being rounded, and constructed after the fashion of that of *Pœcilia* and *Limia*, so that its gape is directed upwards when contracted, and downwards when protracted. Accordingly its affinities with the latter two genera are more intimate than with *Gambusia*.

The specimen of *Girardinus occidentalis*, figured, size of life, on plate xxxix, of the " Ichthyology of the U. S. and Mex. Boundary," is the largest of those collected in the Rio Santa Crux, by John H. Clark, under Col. J. D. Graham. Specimens two inches and a quarter in total length were subsequently collected at Tuczon, Sonora, by Arthur Schott, under Major Emory. All these specimens belong to the female sex. The following formula of the fins is to supersede that which has been previously published :—D 7 ; A 7 ; C 4, 1, 7, 7, 1, 3 ; V 6 ; P 12.—The scales are subelliptical, deeper than long, with radiating furrows upon the anterior section alone. The ground color is either reddish or olivaceous brown above, and yellowish white beneath, with a golden reflect during the breeding season. The periphery of the scales exhibits blackish dots occasionally so crowded as to assume a dark appearance. Along the middle of the flanks may be seen a black fillet which imitates a lateral line; the series of scales over which it runs is sometimes entirely black. A black streak is observed along the under edge of the peduncle of the tail. The fins are of a uniform light yellowish tint.

We refer, for the present, to the same species, numerous specimens in a rather indifferent state of preservation, collected at Tuczon, by Dr. A. L. Heermann, under Lt. J. G. Parke. Amongst them we observe several individuals of the male sex, measuring about an inch and a quarter in total length, rather slender in general appearance, and resembling somewhat the same sex in *Gambusia*. The anal fin, however, is more slender and deeper than in the latter genus, it being composed of but two developed rays preceded and followed by inconspicuous rudimentary ones. The other fins are so much mutilated as not to allow counting their rays with any degree of certainty. The coloration is the same as in the female sex, just alluded to above.

LIII. Specimens of a species closely, allied to the foregoing one, were collected in San Bernardino creek, Mex., by Dr. C. B. R. Kennerly, under Major Emory. That creek, it will be remembered, flows westwards of the Sierra Madre, mingling its waters with those of the Rio Yaqui, which empties itself into the Gulf of California.

The largest of these specimens belonging to the female sex measure two inches and a quarter in total length, being therefore of the same size as some of those of the preceding species. Nothing is more alike than the general aspect of these two species; the present one, however, is more stoutly built. The head constitutes about the fifth of the total length. The caudal fin is posteriorly subtruncated. The dorsal and anal fin are inserted somewhat farther back, each being provided with eight rays instead of seven; otherwise the formula is the same:—D 8; A 8; C 4, 1, 7, 7, 1, 3; V 6; P 12.—The scales have the same shape and structure, but they are proportionally smaller, than in the preceding species.

The specimens of the male sex, measure about an inch and a quarter or a little more. They bear the same relations to their females as those of the preceding species. The dorsal fin exhibits likewise eight rays.

The ground color, in either sex, is of a dark chestnut brown, with black dots at the periphery of the scales, and a lateral black fillet covered by a lateral streak of the width of a scale. A narrow dark streak may also be observed under the peduncle of the tail. In its coloration, therefore, this species does not differ very materially from the foregoing one. The lateral streak alone appears as a more constant feature.

We shall designate it provisionally under the name of *G. sonoriensis*.

LIV. Let it be recalled to mind here, that the mouth in *Gambusia* is constructed after the fashion of *Hydrargyra* and *Zygonectes*, and that its gape is horizontal when protracted, and oblique upwards when in a contracted state. Indeed, the affinities between *Gambusia* and *Zygonectes* are of the most intimate kind, since in *Zygonectes* the anterior margin of the anal fin is sometimes situated in advance of the anterior margin of the dorsal. It is true, we find a slight difference between these two genera, in the gape of the mouth when in a protracted condition, and also in the sexes, which assume a different aspect in *Gambusia*, whilst in *Zygonectes* the differences between the male and the female are a great deal more restricted.

The party under Lt. J. G. Parke, on its way home, collected in Camanche Spring specimens of both sexes of *Gambusia nobilis*, the male of which we had not observed so far. It has the same general aspect as its female, figured on plate xxxix, of the "Ichthyology of the U. S. and Mex. Boundary," being rather short and deep bodied compared to its congeners. In coloration both sexes agree. The largest specimens of the female sex measure two inches and those of the male one inch in total length.

LV. Specimens of *Gambusia affinis* were also collected in San Pedro creek, Tex., and in Dry creek near Victoria, Tex., by Dr. C. B. R. Kennerly, under Major Emory. The male sex measures one and a tenth of an inch in total length, and compares well with the female figured on plate xxxix, of the "Ichthyology of the U. S. and Mex. Boundary," having the same slender appearance and general aspect. The anal fin is somewhat deeper than in *G. patruelis* represented on the plate just alluded to. The color is similar in either sex.

LVI. As to *Gambusia patruelis*, numerous specimens of that species were collected in the upper affluents of the Rio Nueces, by Dr. C. B. R. Kennerly, under Capt. A. W. Whipple, during the Exploration near the thirty-fifth parallel, for a railroad route to the Pacific. The average size of either sex corresponds pretty nearly to the specimens figured on plate xxxix, of the "Ichthyology of the U. S. and Mex. Boundary." Specimens from the Rio Leona, Rio Blanco, and Rio Seco, exhibit a somewhat lighter tint than those from the lower part of the same hydrographic basin. But this may be an alteration subsequent to their immersion in alcohol.

LVII. A curious little species of *Gambusia* from the hydrographic basin of the Rio San Juan, specimens of which having been collected in Rio San Diego, one of its affluents, near Cadereita, New Leon, by D. N. Couch. The largest ones measure an inch and a half in total length, and belong to the female sex alone. The body is deep upon its middle and the tail tapering. The head enters about four times and a half in the total length. The eye is proportionally large and circular ; its diameter entering three times in the length of the side of the head. The dorsal fin is very narrow and elevated, and proportionally higher than in the other species so far known of this genus. The anal fin is likewise narrow and deep, and resembles the dorsal in that respect. The ventrals are small, and the pectorals well developed. We have not been able to count with accuracy the rays of the fins, owing to the desiccated condition of the specimens preserved; in the dorsal and anal fins they are less numerous than in the other species of the genus. The color of the body is reddish-brown, except the belly, which is yellowish or whitish. Small black spots may be observed along the dorsal region near the base of the scales. The dorsal and anal fins are greyish ; the caudal ventrals and pectorals, olivaceous.

The species might be designated under the appellation of *Gambusia speciosa.*

LVIII. In the collection of the late Louis Berlandier, of Matamoras, we find another species of *Gambusia*, which differs from its congeners by the slenderness of its form and general appearance : hence the name of *G. gracilis* by which we propose to record it.

The largest female specimens measure about an inch and a half in total length, of which the head constitutes a little more than the fifth. The mouth is rather large compared to that of the foregoing species. The diameter of the eye enters about three times in the length of the side of the head. The body in its profile is subfusiform. The dorsal fin is higher than long, superiorly convex. The caudal is rounded off posteriorly. The anal is larger than the dorsal, deeper than long and exteriorly convex, the posterior extremity of its insertion being nearly opposite the anterior margin of the dorsal. The tip of the ventrals extends almost to the anterior margin of the anal. The pectorals are well developed and project beyond the insertion of the ventrals. The rays are :—D 6 ; A 9 ; C 5, 1, 6, 6, 1, 4 ; V 6 ; P 13.—The scales are moderate sized, much deeper than long, subelliptical in their outline, more convex posteriorly than anteriorly with numerous and well developed radiating furrows upon the anterior portion alone.

The largest male specimens which have come under our observation measure a little over an inch in total length. They are very similar to the female sex, rather more slender. The anal fin exhibits the usual structure peculiar to that genus. The first ray is a mere rudiment ; the second being the stoutest and longest ; the third forms, with the second, the elongation of that fin, and is followed by four shorter rays somewhat better developed, however, than in the other species, which we have examined.

The color is olivaceous brown ; the dorsal and caudal fin exhibits narrow transverse, blackish bars ; the other fins being olivaceous.

LIX. Mr. John Potts has collected in Chihuahua River another species of *Gambusia* which appears to reach a larger size than any of the foregoing species, reminding us somewhat by its general appearance those occurring in Cuba.

The specimens before us are all of the female sex, and measure two inches and a quarter in total length, in which the head enters about five times. The head itself is rather short, whilst the mouth is proportionally large. The diameter of the eye enters thrice in the length of the side of the head. The dorsal fin is higher than long, somewhat convex superiorly. The caudal is rather short and subtruncated posteriorly. The anal is deeper than long and a little broader than the dorsal; the middle of its insertion corresponding to the anterior margin of the dorsal. The ventrals are very small and far from reaching the vent with their extremities. The pectorals are of moderate development, spear-shaped when not expanded. The rays are:—D 9; A 10; C 6, 1, 7, 7, 1, 6; V 6; P 12.—The middle rays of the dorsal and anal fins exhibit bifurcations of the second degree conspicuously developed. The scales are of moderate development. The body is chestnut brown, and the abdomen yellowish golden, with blackish specks along the middle of the flanks to the caudal fin. The periphery of the scales is margined with black. The dorsal, caudal and anal fins are greyish and speckled, the ventrals and pectorals being olivaceous.

To distinguish this species from its congeners, the name of *G. senilis* is here proposed.

On the Primary Divisions of the SALAMANDRIDÆ, with Descriptions of Two New Species.

BY E. D. COPE.

Class AMPHIBIA. Order CADUCIBRANCHIATA. Sub. Ord. URODELA.

Fam. 1. PROTONOPSIDÆ. Branchial apertures persistent. (Trematoderes Dum. & Bibr).

Fam. 2. SALAMANDRIDÆ. Branchial apertures none. (Aretoderes Dum. & Bibr.)

The characters of the following subfamilies are taken from the position, etc., of the palatine and sphenoidal teeth, and we are of the opinion that the groups thus formed will be found to be more natural than those established exclusively upon the form of the tongue.

1. *AMBYSTOMINÆ.*

Palatine teeth upon elevated processes of the vomero-palatine bones, in straight or arched transverse series only, sphenoidal teeth absent. Tongue large, thick, papillose, but slightly free. Form stout. Skin mostly smooth. North America.

1. MEGALOBATRACHUS (Tschudi) 1838. Syn. *Cryptobranchus* Van der Hoeven, 1838. *Sieboldia* Bonaparte, 1850. *Tritomegas* Dumeril & Bibron, 1850.

The great aquatic Salamander of Japan is closely allied to our Protonopsis (Menopoma Harlan), but the absence of branchial slits places it among the true Salamanders. By the position of the palatine teeth it evidently belongs to the present subfamily, and not among the Tritons, as placed by Dr. Hallowell. (Journ. Acad. Nat. Sci., vol. iii. Second Series, p. 357).

2. CAMARATAXIS Nob. Palatine teeth upon four processes, the two posterior short oblique, and behind the internal nares; the anterior forming an arch, interrupted at the palatine suture, and concentric with the maxillary series. Tongue broad, thick, papillose, attached by the whole posterior border, slightly free laterally. Extremities stout, digits free, 4—5. Tail not long, compressed.

C. maculata.—*Ambystoma maculatum* Hallowell, Journ. Acad. Nat. Sci., Second Series, vol. iii. p. 355.

This species, which inhabits New Mexico, makes the nearest approach to the preceding genus in the form of the series of palatine teeth. In this respect it also exhibits too great a departure from the straight or slightly angular series of Ambystoma, to remain in that genus.

3. Ambystoma (Tsch.)

The nearest approach to the preceding species, in general appearance and form of the palatine series, is seen in the Ambystoma nebulosum of Dr. Hallowell; but the processes are not arched, but straight, presenting an obtuse angle forward.

The genus *Xiphonura* Tschudi (*Heterotriton* Gray) does not seem to be sufficiently distinct either with respect to dental peculiarities, or the form of the tail. Though Ambystoma ingens, luridnum, and Californiense resemble each other in these points, and are quite different from the A. opacum, yet by the intervention of such species as A. tigrinum (Green)—fuscum (Hallowell)—bicolor (Hall.)—punctatum (Linn.), which show a regular gradation of form, the hiatus is filled, and no generic division can be made.

The following species appears to be undescribed:

A. conspersum.—Head oval, rather large; extremities slender, fourth toe twice as long as second; tail not longer than body, much compressed; tongue elliptical, very slightly free at the sides; palatine teeth in two short patches between the internal nares, presenting a concavity backwards. Length 1 inch 10 lines: head 4 l.: body 9 l.: tail 9 l. Head, back and tail cinereous brown, finely speckled with white dots, which are confluent on the snout. An indistinct row of white spots on the sides. Beneath dirty white.

Londongrove, Chester Co., Pennsylvania.

The animal described was probably not fully grown, so that though the measurements indicate the smallest known Ambystoma, the adult may be larger. We are unable to refer it as the young of any of our Pennsylvania Ambystomata. The form of the tail would indicate aquatic habits, but it was found in the woods, and when placed in water showed the greatest aversion to it.

It resembles Ambystoma porphyriticum of the Academy's collection, but differs in color of abdomen, lateral series of spots, and larger head and mouth. (We allude to the specimen from the Wabash, presented by Dr. McMurtrie). The two latter points, it will be noticed, are those in which this Wabash specimen differs from Prof. Green's description, according to Dr. Hallowell. (Proc. Acad., Feb. 1856). A. porphyriticum has as yet been found west of the Alleghanies only. The young of A. laterale (Hall.) is not known, nor has the geographical distribution of that species been well ascertained. We have been unable to find Gray's description of his A. punctulatum, which is, however, a Californian species.

4. Onychodactylus (Tsch.)—The genus Ensatina (Gray) which is stated by Dr. Hallowell (Proc. Acad. Nat. Sci. vol. 8, p. 238) to be destitute of sphenoidal teeth, may enter this subfamily.

2. *SPELERPINÆ.*

Palatine teeth in short series upon transverse processes of the palatine bone; sphenoidals numerous, aggregated upon two thin, ovate or elongate bony plates (becoming cartilaginous), which lie longitudinally and contiguously upon the sphenoid bone. Tongue (generally) thin, borne upon the much exserted cartilaginous elongation of the os hyoides; some genera with an additional anterior membranous attachment. Form slender; skin smooth. North America and Europe.

I. PLETHODONTÆ.

Tongue with a membranous attachment from the pedicel to the anterior edge, leaving the lateral and posterior borders more or less free.

1. Plethodon (Tsch.)—The tongue in this genus is not attached by its posterior border, as described, though very slightly free.

2. Desmognathus (Baird).—D. auriculata (Holbrook). D. nigra (Green).

D. fusca (Green). *Salamandra quadrimaculata* (Holbrook) is undoubtedly the young of this species.

The teeth of this species—as in all others of the Spelerpinæ that we have examined, are acrodont. Superior and inferior maxillaries slightly curved, compressed; summits truncate, having a cutting edge interiorly, and a sharp point exteriorly, with a crescent-shaped depression between. Color hyaline, point and edge amber. Sphenoidals more cylindrical and incurved.

D. ochrophæa.*—Form more slender than D. fusca, less so than Pleth. erythronotus. Tail as long as the head and body, subquadrangular at base, beyond, slender and slightly compressed. Thirteen distinct costal folds. Length 2 inches 11 l.; tail 17 l.

Color above, varying from bright to dirty and fuscous straw color, most specimens with an indefinite medial row of irregular brown spots, a deep brown line passing through the eye and along the dorso-lateral region of the body to the end of the tail; distinctly defined along its upper edge; fading into fuscous marblings on the sides. Belly pure white.

Susquehanna County, Pennsylvania.

This is a terestrial species, and very common beneath the bark of hemlock logs. We have never noticed it in the South-eastern part of Penna., but it has probably been passed over as Spelerpes bilineata, to which it bears considerable resemblance, or as a pale variety of Plethodon erythronotus. From the latter it differs in attachment of tongue, less slender form, want of marblings on the belly, etc. Brownish yellow takes the place of red on the back, though the young have indications of the same indefinite pink spotting as in that species and Desm. fusca.

3. Aneides (Baird.) 4. Heredia (Girard.) 5. Hemidactylium (Tsch.) Is *Salamandra melanosticta* (Gibbes) identical with *H. scutatum* (Tschudi)?

II. SPELERPEÆ.

Tongue boletoid—attached by a central pedicel only.

6. Batrachoseps (Bp.) 7. Spelerpes (Raf.) 8. Œdipus (Tsch.) 9. Geotriton (Bp.)

10. Pseudotriton (Tsch.) The teeth of this species exhibit the following peculiarities. Acrodont, much incurved, cylindrical, with a central pulp

---

* Since the above was sent to press, we have been informed by Prof. Baird that he considers this animal identical with Salamandra Haldemani (Holbrook) which he is of opinion is one of the "very numerous varieties of Desmognathus fusca." We have never seen Prof. Holbrook's original specimens of S. Haldemani, but it has been represented by all subsequent authors to be a Spelerpes (Cylindrosoma D. & B.), a genus differing from Desmognathus in its boletoid tongue. We would also hazard a doubt as to the identity of this animal with Desm. fusca. The latter is decidedly aquatic in its habits, living beneath stones, etc., in rapid streams.

The former we have never seen in the water, but have invariably found it beneath bark, under logs, etc. It is rather sluggish, resembling Plethodon erythronotus in this respect. Should this animal be the Salamandra Haldemani of Holbrook, it will stand as Desmognathus Haldemani Nob.

cavity, terminating in two points, the interior much larger than the exterior; both of a bright amber color, the body of the tooth being hyaline in appearance. The palatines are similar to the superior maxillaries, the inferior maxillaries only differ in being flattened on their inner side, and the sphenoidals in being more curved.

3. HYNOBIINÆ.

Vomero-palatine bones destitute of teeth, posteriorly elongated and cuneiform, occupying a deep emargination in the outline of the sphenoid bone. Sphenoidal teeth present, upon the outer edge of two ridges of the sphenoid bone which lie along the sphenoido-palatine suture, thus forming two longitudinal series closely approximated posteriorly, widely diverging and becoming transverse, anteriorly. Tongue rather large, much attached. Very aquatic species. Japan.

This subfamily presents a singular and very distinct modification of the arrangement of teeth on the palate.

Tschudi has distinguished generically the only two species of this subfamily, under the names Pseudosalamandra and Hynobius, and apparently upon insufficient grounds. MM. Dumeril and Bibron have united them under the name Ellipsoglossa, but as Tschudi's names have priority, one or the other of them must be adopted. We select as the least objectionable

1. HYNOBIUS (Tsch.) H. nebulosus (Schl.) H. naevius (Schl.) *Pseudosalamandra nævia* Tsch. Class. 1838. *Molge striata* Gray, Cat. Brit. Mus. 1850.

4. *SALAMANDRINÆ.*

Palatine teeth upon the inner edge of processes of the palatine bones, which are elongated horizontally and posteriorly over the sphenoid. No transverse palatine series. Tongue generally thick, and seldom free to much extent. Skin mostly rough, or changing with the habitat. Form usually stout. Europe, North America and Japan.

It would appear as though herpetologists had not given the same attention to the clear definition of their genera among the animals of this subfamily, as elsewhere. In the following brief synopsis, the diagnoses of the genera have been drawn up with reference to and including only the *distinctive* characters.

I. SALAMANDRÆ.

Palatine processes slender, curved, approximating posteriorly. Ribs not developed. Terrestrial species.

1. SALAMANDRA (Laurenti.) Palatine teeth in two curved series, approximated posteriorly. Tongue oval, thick, slightly free at its edges. Digits free, 4—5. Parotids large, porous. Tail moderate, cylindrical.

S. maculosa (Laurenti.) S. corsica (Savi.) S. atra (Laurenti,) 1768. S. nigra, Gray, Cat. Brit. Mus. 1850.

II. PLEURODELÆ.

Palatine processes cuneiform. Ribs greatly developed, sometimes piercing the skin. Terrestrial and aquatic.

2. SALAMANDRINA (Fitzinger.) Palatine series nearly in contact at their anterior extremities, for a short distance almost parallel, then widely diverging. Tongue ovate, broad behind, free laterally and posteriorly. Digits 4—4. Tail subcylindrical.

S. perspicillata Fitz. 1826. *Seiranota condylura* Barnes, Silliman's Journ. v. ii. p. 278.

3. PLEURODELES (Michaelles.) Palatine teeth in two parallel series, whose anterior extremities are considerably in advance of the internal nares, and

slightly converging. Tongue small, oval, free posteriorly and laterally. Parotids present, porous. Digits 4—5. Tail long, compressed.

P. Waltli (Mich.)—*Salamandra pleurodeles*, Schlegel, Fauna Japonica, p. 117. ? P. exasperatus (Dum. & Bibr.) Erp. Gen. vol. 9, p. 420.

4. Bradybates (Tschudi.) Palatine teeth few. Tongue small, round, attached by its whole inferior surface. Extremities short, small; digits 4—5. Body depressed, no parotids. Tail short, broad at base, subcylindrical.

B. ventricosus (Tsch.)

III. Tritones.

Palatine processes cuneiform. Ribs not developed. Habits aquatic, many species furnished in the breeding season with dorsal crests, and interdigital membranes.

5. Glossoliga (Bp.)—Longitudinal series of palatine teeth in two widely separated rows, slightly converging anteriorly. A strong postorbitar arch, formed by the union of a process of the posterior frontal with that of the tympanic bone. Maxillary bone uniting immediately with the pterygoids. Tongue rounded, free posteriorly and laterally. Digits 4—5. Tail moderate, somewhat compressed.

A remarkable genus, quite distinct in many points of structure from Euproctus, with which Dum. & Bibron unite it.

G. Poireti (Gervais.)

6. Diemyctylus (Rafinesque.)—Longitudinal series of palatine teeth in two straight rows, closely approximated anteriorly, widely diverging posteriorly. A strong long arch above and behind the orbit formed by the united processes of the posterior frontal and tympanic bones. Tongue small, thick, oval, attached by its whole inferior surface or with a very slightly free lateral border. Digits 4—5, the exterior and interior upon the hind feet rudimentary. Tail moderate, compressed.

Syn. *Diemyctylus* Rafinesque, 1820. *Notopthalmus* Raf., 1820. *Cynops* Tsch. 1838. *Taricha* Gray, 1850.

We regret that the law of priority compels us to employ Rafinesque's objectionable name in preference to *Cynops* Tschudi or *Taricha* Gray. We prefer *Diemyctylus*, though apparently unmeaning, to the egregiously inappropriate *Notopthalmus* of the same date.

D. torosus.—*Triton torosus* Esch. Zool. At. pt. v. pl. 21. fig. 15, 1833. *Triton Ermanni* Weigmann, 1835. *Triton granulosus* Skilton, 1849. *Taricha torosus* Gray, Cat. Brit. Mus., 1850.

The external characters of this animal present no peculiarity that appears to us to warrant generic separation from the succeeding species.

? D. lævis.—*Taricha lævis* Bd. & Girard, Proc. Acad. Nat. Sci. vol. 6, p. 302.

D. pyrrhogaster.—*Molge pyrrhogastra* Boie, Isis, p. 215, 1826. *Salamandra subcristata* Schlegel, Fauna Japonica, p. 135, 1833. *Cynops subcristatus* (Tsch.) Class. der Batrachier, p. 94, 1838.) *Cynops pyrrhogaster* (Gray,) Cat. Brit. Mus. 1850.

This species in the development of the temporal region exhibits characters most typical of the genus. We fail to perceive the generic difference admitted by authors to exist between this and the following species.

D. viridescens.—*Triturus* (*Diemyctylus*) *viridescens* Raf., 1820. *Triturus* (*Notopthalmus*) *miniatus* Raf., 1820. *Salamandra symmetrica* Harlan, 1825. *Salamandra dorsalis* Harlan, 1828. *Salamandra millepunctata* Storer, 1838. *Triton millepunctatus* Dekay, 1842. *Triton dorsalis* Hall., 1842. *Triton symmetricus* Dum. & Bibr., 1854.

We include in the above synonymes those of the nominal species D. miniatus, which we think with Dr. Hallowell (Proc. Acad. Nat. Sci. Feb. 1856) is a state of D. viridescens. We have caught specimens with or without the dorsal or ventral spots; destitute of, with rudimentary, or fully developed crests; and of every shade of color between vermillion and brownish green. The color and character of the skin seem to be dependent upon the amount of moisture in the situations in which they are found. Those from high and dry spots are redder and rougher than those from marshy situations: while those whose habits are for the time aquatic, are still greener and smoother, and exhibit every degree of development of the dorsal crest. Thus it is probable that this species undergoes changes similar to those of the European Tritons, as detailed by Schlegel and Kaup.

7. Euproctus, (Gené.)—Series of palatine teeth closely approximated anteriorly, posterior extremities widely diverging. Skull elongated, depressed. A weak post orbitar arch formed by the slender processes of the posterior frontal and tympanic bones. Superior maxillary bone uniting with the pterygoid by the intervention of a jugal bone. Tongue oval, free behind and at the sides. Anal region frequently prolonged. Digits 4—5. Tail compressed.

E. platycephalus (Otto.)—*Molge platycephalus* (Otto.) 1826. *Euproctus Rusconi* (Bonaparte), 1839. *Euproctus platycephalus* (Gray,) 1830. *Euproctus puncticulatus* (Dum. & Bibr.)

This and the following three species have been described by MM. Dum. & Bibron as Tritons, but are considered by M. Alfd. Duges (Osteologie et Myologie des Batraciens) as varieties of Euproctus platycephalus. The present species is evidently a Euproctus, judging from the figure of the skull in the Erpetologie generale.

E. rugosus (D. & B.) E. repandus (D. & B.) E. Bibronii (Bell.)

8. Lissotriton (Bell.)—Series of palatine teeth nearly in contact anteriorly, widely diverging posteriorly. Post orbitar arch wanting; posterior frontal bone with a slight projecting supra-orbitar border. Tongue moderate, circular, depressed, slightly free all round. Digits 4—5. Tail compressed.

L. punctatus (Latr.)—*Triton punctatus* Auctorum. *Lissotriton punctatus* Bell, 1839. *Lophinus punctatus* Gray, 1850.

The form of the tongue seems to be the only peculiarity which separates this species from the true Tritons. This, though a slight character, is probably better than that upon which Prof. Bell principally relies in establishing the genus—viz.: the smoothness of the skin:—thus including the Triton palmipes, and perhaps other species at *proper seasons* of the year.

9. Triton (Laurenti). Series of palatine teeth closely approximated anteriorly, diverging posteriorly. Supra-orbitar border of the posterior frontal bone prominent; the process rudimentary or wanting. Tongue small papillose, free at the sides only. Digits 4—5. Tail moderate, compressed.

§ Ommatotriton (Gray). Tongue thick, like a wart, lateral borders scarcely free.

Syn. *Ommatotriton* Gray, (1850). *Lissotriton* (Bell) (Pars), 1839. *Lophinus* (Gray), (Pars) 1850.

T. palmipes (Latreille)? *Molge vittatus* Gray, (1820). *Lissotriton palmipes* Bell, (1839). *Triton vittatus* Dum. & Bibr. (1854).

T. alpestris (Laur.)

T. palmatus (Schn.) (1797). *Lophinus palmatus* (Gray), 1850.

§ Triton (Laurenti). Tongue depressed, considerably free laterally.

Syn. *Triton* (Laur.) Syn. Rep. p. 38, (1768). *Hemisalamandra* (Pars) (Duges), (1852).

T. marmoratus (Latreille). This species stands first in Laurenti's Synopsis of Tritons. In the form of the tongue it approaches, and in osteological characters closely resembles, the Hemisalamandra cristata, but the almost parallel rows of palatine teeth in the latter species generically distinguish it.

10. Hemisalamandra (Duges), (1852). Palatine teeth in two widely sepa-

rated longitudinal rows, which slightly converge anteriorly. Post-orbitar arch wanting. Tongue oval, flat, attached by its anterior and posterior borders, free laterally. Digits 4—5. Tail long, compressed.

H. cristata (Laur.) *Triton cristatus* Auctorum. What species Merrem assigned as the type of his genus Molge, we have been unable to ascertain, nor would it seem to be generally well known among herpetologists, from the number and variety of species to which it has been applied. The following are some of them:—Plethodon erythronotus, Hynobius nævius, Euproctus platycephalus, Triton palmipes, Diemychylus pyrrhogaster.

On the genus CALLIONYMUS of Authors.

BY THEO. GILL.

In the genus *Callionymus*, as it has been restricted by modern naturalists, three distinct genera are yet confounded. Sharing all of the following characters, two of them differ so much from each other in the position of the branchial apertures, that there can be no doubt of their claims to rank as separate genera. The characters common to all, and which distinguish them as a subfamily, will be first given, and afterwards the generic diagnoses.

The body is elongated, and often transversely oval anteriorly, and consequently broader than high; thence it gradually declines in height and thickness to the base of the caudal fin, and being often quite thick near that fin, assumes there a peculiar bulging appearance. The whole is naked and smooth.

The lateral line commences at the mastoids, and is connected, near its origin, to that of the opposite side by a transverse nuchal line; thence it generally declines slightly, and is then continued along the side of the back or the upper part of the side to the caudal fin.

The head is in general outline depressed and triangular, but varies in detail. The preopercle has a stout horizontal process which generally terminates posteriorly in a group of radiating and recurved spines, one above the other, or which has the spines along the superior border. The profile is oblique. The preorbitals or first sub-orbitals are prolonged anteriorly and frequently extended towards each other, thus forming a roof under which the jaws are concealed when retracted. There appears to be on each side but a single nostril, which is situated before the eye.

The mouth is small and sub-terminal, but under the muzzle, and is protractile downwards.

The teeth are villiform, and present in a moderately broad band in each jaw. The palate is smooth.

The tongue is generally far within the mouth; it is sometimes entirely united to the floor of the mouth, while at other times it is anteriorly free.

The branchiostegal membrane has on each side five or six slender rays.

The branchial apertures are very small and superior.

The first dorsal fin commences before the bases of the pectorals; it varies in shape, but there appears to be a constant arrangement of the rays. These are always four in number, and the first two are approximated at the base, but as the membrane enlarges, diverge from each towards their ends; the third is considerably posterior: the fourth is separated by a still wider interval from the third.

The second dorsal commences a short distance behind the first, is oblong and is distant from the caudal less than its length.

The anal has the form and structure of the second dorsal, but its commencement and termination are posterior to those points of the dorsal.

The caudal is elongated, but narrow, and has only from ten to thirteen articulated rays, of which from one to three of the superior and inferior are simple.

The pectoral fins are well developed, and are angular at the middle of their posterior margins. Their bases are vertical, but concave.

The ventrals are on the sides of the breast, and their bases are parallel or nearly so with the fish's length: they are separated from each other by a very wide and flattened area, and their posterior rays are connected by a membrane to the lower half of the bases of the pectoral fins. These fins are more or less larger than the pectorals.

Such are the chief external characters of this singular group, and as they are apparently common to all its species, they should in this case be eliminated from the generic, and much more from the specific description. The different proportions of these parts are their relative situation to each other, are alone specific characters. The fins present a singular diversity, not alone in form, but in structure, in even the same species. Some of them, especially the first dorsal and caudal, are often much more developed in the males than in the females. The rays, at least of many of them, are very variable in their character, sometimes nearly all them being simple, and at others, almost all are branched. It is therefore impossible to now give a formula indicative of the exact permanent condition of the fins.

Two of the genera confounded under the name of *Callionymus*, as has been already stated, differ chiefly in the position of the branchial apertures. In the true *Callionymi*, they are of an oval form, and situated near the inner angle of the superior opercular margin, and on the sides of the nape. In another group, they are present as small perpendicular slits behind the opercular margin, and have been well described by Valenciennes in the article on *Callionymus opercularis.* They are by that naturalist said to be concealed by a long pointed production of the operculum, and by a membrane which connects this production to the nape, and they thus present the appearance of transverse slits under this membrane when the opercula are raised up. Valenciennes has well remarked that the species whose peculiarity he thus describes may one day become the type of a peculiar sub-genus, but he has not so named it. There can be at this day no doubt entertained as to the propriety of forming for the species thus distinguished a distinct genus, and the name of *Synchiropus* is offered as its generic appellation, a name which alludes to the peculiar connection of the ventrals to the bases of the pectorals. The genus that will be described under this name does not embrace the *Callionymus dactylopus* of Bennet which is the type of a distinct, but allied genus.

The generic diagnoses of the genera will then be as follows:

I. Callionymus, L. restr.

Aperturæ branchiales ovatæ, in latere nuchæ utroque sitæ. Pinnæ ventrales spina et quinque radiis ramosis, omnibus membrana conjunctis.

This genus, as far as relates to the species referred to it, is synonymous with the genus *Uranoscopus* of Gronovius, who has reversed the Linnæan names of *Callionymus* and *Uranoscopus*, as used by modern naturalists, the former Gronovian genus including the *Uranoscopi* and the latter the *Callionymi.*

Besides the numerous species that have been already described, two that appear to be undescribed are in the collection of the North Pacific Exploring Expedition. One (*C. tæniatus* Gill,) is lilac colored, with a silvery line and row of spots on the sides, and with a black spot, bordered by white, on the first dorsal. The other (*C. inframundus* Gill,) is light brownish, marbled with white, and with a blackish first dorsal. The former is from China; the latter from Japan.

II. Synchiropus, Gill.

Aperturæ branchiales parvæ, lineares, fere perpendiculares, post opercula. Pinnæ ventrales radiis spinoso et quinque ramosis membrana conjunctis.

The genus thus characterized embraces five known species, which are all inhabitants of the Eastern seas:

1. S. lateralis.

Syn. Callionymus lateralis, Richardson, Zoology Sulphur, p. 65, pl. xxxvii, figs. 5 and 6. 1844.

The specimen figured by Richardson is a female. The male is distinguished by a more slender and elongated body, and by a first dorsal, about a third higher than that of the female. The first dorsal has also a black spot margined with white at the posterior angle, and the two bars of the caudal which are present in the female are absent in the male. There are also two rows of blue spots on the anal of the female, which are not mentioned in Richardson's descriptions: these spots are replaced in the males by two corresponding lines. Richardson simply states that his fish has a narrow streak of dusky brown near the lower border of the anal. There can, however, be no doubt as to the specific identity of these three varieties. Mr. Stimpson dredged specimens at Hong Kong from a depth of eight fathoms.

2. S. lineolatus.

Syn. Callionyme lineolo, } Val. Hist. Nat. des Poissons, vol. xii. p.
Callionymus lineolatus. } 307. 1837.

This species is quite distinct from the preceding, which has been compared with it by Sir John Richardson.

3. S. ocellatus.

Syn. Callionymus ocellatus. Pallas, Spicilegia Zoologica, Fasc. octav. p. 26, pl. iv. figs. 1, 2, 3. 1770.
(Callionime,) l'œille Daubent. Enc. Method. vol. 3, Poiss. pp. 75, 277. 1787.
Le petit Argus, } Bonnaterre Tableau Encyc. Method., Ichthyologie,
Callionymus ocellatus, } p. 43. 1788.
Callionymus ocellatus, Artedi Genera Piscium, Walb. ed. p. 608. 1792.
" " Linn. Systema Naturæ, Gmel. ed. p. 1154. 1793.
Callionyme pointillé, } Lacepede Hist. Nat. des. Poissons, vol. 2, pp.
Callionymus punctulatus, } 328, 340. 1800.
Callionymus ocellatus, Bloch Systema Ichthyologiæ Schneid. ed. p. 40. 1801.
Callionyme ocelle, } Val. Hist. Nat. des Poissons, vol. 12, p. 309.
Callionymus ocellatus, } 1837.
Callionymus ocellatus, Blkr. Natuurk. Tijd. v. Ned. Ind. vol. 8, p. 422. 1855.

4. S. opercularis.

Syn. Callionyme a grand opercules, } Val. Hist. Nat. des Poissons, vol.
Callionymus opercularis, } 12, p. 305. 1837.

5. S. operculareides.

Syn. Callionymus operculareides, Blkr. Natuurk. Tijd. v. Ned. Ind. vol. 1, p. 32. 1850.

A third genus with the branchial apertures in the same position as *Synchiropus*, is readily distinguished from that genus, as well as from the true *Callionymi*, by its first articulated ray; this ray is unbranched and much longer than the following, from which it is almost entirely separated, and is only connected with the spinous ray. To the only known species, the name of *Callionymus dactylopus* has been given. As the specific name alludes to the principal generic character, and is also much more appropriate as a generic than a specific one, it is now conferred on the genus, and the name of its author is given as a specific one.

III. Dactylopus, Gill.

Aperturæ branchiales parvæ, lineares, post opercula. Primæ ventrale radiis spinoso et quinque articulatis, radio primo articulato simplici, elongato, radio spinoso conjuncto, a radiis ramosis disjuncto. Pinna dorsalis prima spinis duobus primis filiformibus, longissimis, aliis filiformibus sed brevioribus.

1. D. Bennetti.

Syn. Callionyme a doigt libre, } Val. Hist. Nat. des Poissons,
Callionymus dactylopus, Ed. Benn., } vol. 12, p. 310. 1837.
Callionymus dactylopus, Blkr. Naturuk. Tijd. v. Ned. Ind. vol. 3, p. 559. 1852.

Description of HYPORHAMPHUS, a New Genus of Fishes allied to Hemirhamphus, Cuv.

BY THEO. GILL.

All those species of fishes which resemble in external form the *Esox Braziliensis* of Linnæus, and for which Cuvier framed the genus *Hemirhamphus*, have been described as having a straight band of short, granular and equal teeth in each jaw.* Such is the character given to the genus by Valenciennes, in the nineteenth volume of the "Histoire Naturelle des Poissons," where twenty-seven species are referred to it. This character is also repeated in many of the specific descriptions, and many of the species are distinguished by the more or less small size of the teeth. Had any other form or system of dentition existed, it could therefore scarcely have been overlooked by the distinguished French naturalist. It is with much pleasure that I now submit to Ichthyologists the description of a fish which resembles in almost every feature, the known species of *Hemirhamphus*, but which have in each jaw a band of distinctly tricuspidate small teeth. Two specimens are in the collection made by the author, at the island of Barbadoes. Owing to an unfortunate accident, the specimens are in poor condition—the scales being mostly rubbed off and the fins more or less broken. I am unable, therefore, to furnish at present as full a discription as could have been wished.

HYPORHAMPHUS Gill.

Body elongated, very slowly decreasing in height to the dorsal. Scales large, each with a subcentral nucleus and delicate concentric striæ. Head elongated, conical in profile, broad and flattened above. Lower jaw forming an elongated, slender and depressed bill. Upper jaw short and acutely rounded. Teeth small, distinctly tricuspidate, and with the median cusp largest, in a moderate band on each jaw. Dorsal and anal fins posterior and opposite each other, each oblong and simple. Caudal fin moderate, emarginate. Pectoral fins moderate. Ventral fins subcentral, small or moderate. Ventral carina distinct on each side. Tongue thin, moderate, rounded anteriorly, with parallel sides, and with a median groove, free before and on the sides.

H. tricuspidatus, Gill.—The greatest height equals an eleventh of the extreme length, from the point of the lower jaw to the end of the caudal fin; the greatest breadth exceeds three-fifths of the height. The head, inclusive of the lower jaw, forms more than three-tenths of the extreme length. The lower jaw, from the tip to the corner of the mouth, constitutes a fifth of the same length, and is five times larger than the upper jaw. The radial formula appears to vary. In a small specimen it is as follows:—D 14, A 17, C 4, I 6, 7, I 4, P 11, V 6.

In a large one—D 15, A 16, P 10.

They are both too much damaged to retain the true colors. The broad silvery band is present as usual, and widest posteriorly. The upper part of the dorsal is blackish.

---

* I have not been in a position to consult the "Catalogue of Malayan Fish," in the eighteenth volume of the Journal of the Asiatic Society of Bengal, where Cantor has described a "*Hemirhamphus tridentifer*." That species may possibly belong to the genus now described, although the teeth of *Hyporhamphus* would be very improperly compared to tridents. The specific name may, however, only allude to the three denticles of each tooth.

On DACTYLOSCOPUS and LEPTOSCOPUS, two New Genera of the Family of Uranoscopidæ.

BY THEO. GILL.

DACTYLOSCOPUS Gill.

Body elongated, with the dorsal and abdominal outlines slowly converging to the caudal fin. Scales large, regularly imbricated. Lateral line straight, and running along the middle of the side. Head oblong, subcubical and smooth. Preopercle entire, opercle radiatedly fringed behind. Mouth nearly vertical. Tongue thick, narrowed anteriorly, attached to the floor of the mouth. Labial velum without a barbel. Anus a short distance behind the base of the pectoral fins. Dorsal fin subequal, single and very long, commencing above or before the anus, and continued almost to the base of the caudal. Anal fin commencing behind the anus, and with the same form and termination as the dorsal. Caudal fin small and narrow, posteriorly subtruncated. Pectoral fins subangular. Ventral fins jugular, closely approximated, and each with three stout simple and articulated rays.

D. tridigitatus Gill.—The head from the snout to the margin of the *opercle* forms about a fifth of the extreme length.

The greatest height is equal to a seventh of the same. The caudal fin forms an eighth. The dorsal commences over the lower angle of the base of the pectorals, or immediately before the margin of the operculum.

D 40, A 34, C 1, 5, 5, 1, P 13, V 3.

The color, as far as preserved, is gray, marbled with white.

Three specimens were obtained by the describer at the island of Barbadoes. The largest is slightly more than three inches in length. They are all in a bad state of preservation.

This is a most interesting genus, from the unusual combination of the characters which it presents. From all the species that have been hitherto referred to the genus *Uranoscopus*, it is at once distinguished by the entire absence of teeth on the palatine arch, and by the presence of only *three rays* to each of the *ventral* fins. Notwithstanding these anomalous characters, it presents so close a resemblance in general form to a species that has been described by Sir John Richardson, as *Uranoscopus macropygus*, that it might readily be referred to the genus by a casual observer. The same smooth head, the same gradually tapering body, the long dorsal and anal continued to the base of the caudal, the regularly imbricated scales, the straight and median lateral line, and the fringed operculum, are seen in both genera. In most of these characters, the two fishes are unlike any of the other *Uranoscopi*. *Dactyloscopus* is again distinguished from the so-called *Uranoscopus macropygus*, besides the two characters that have been already pointed out by the relative length of the dorsal and anal fins, and by the relative situation of the ventrals to each other. In the first described by Richardson, the anus is even more forward than in the West Indian species, and the anal fin commences immediately behind. The dorsal begins at some distance behind the nape, and over the sixth or seventh anal ray. The ventrals are also seperated from each other by a wide interval. In the genus *Dactyloscopus* the dorsal commences above the lower angle of the pectorals, and therefore considerably in advance of the anal fin. The ventrals are also closely approximated to each other, and in this respect, resemble the typical *Uranoscopi*. *Uranoscopus macropygus* has a smaller operculum than *Dactyloscopus tridigitatus*, and this operculum is also triangular and fringed along its upper margin. The former species having been placed in the genus *Uranoscopus*, it is, of course, to be understood that it is provided with teeth on the vomer and palatine bones. As it is advisable that it should be erected into a distinct genus, the name of *Leptoscopus* is now conferred on it, and the *comparative* characters of the two genera are herewith given.

I. Dactyloscopus Gill.

Dentes palatini et vomerini nulli. Pinnæ ventrales radiis tribus articulatis, approximatæ. Pinna dorsalis ante anum incipiens.

D. tridigitatus.

Hab.—Caribbean sea.

II. Leptoscopus Gill.

Dentes palatini et vomerini. Pinnæ ventrales distantes, radiis spinosis et quinque ramosis. Pinna dorsalis post anum incipiens.

L. macropygus.

Syn. *Uranoscopus macropygus* Richardson, Zoology Erebus and Terror, Fishes, p. 55, pl. 33, figs. 4, 5, 6, 1846.

Hab.—Australia.

The first two characters given in each of the above generic diagnoses, are in this case of more than generic importance. Had either of them existed alone, the genera might *possibly* have been naturally placed in the same tribe or subfamily. Combined as they are, they appear to be unquestionably the indices of distinct groups. *Dactyloscopus* is therefore placed as the type of one subfamily,—*Dactyloscopinæ*, and *Leptoscopus* of another—*Leptoscopinæ*. Notwithstanding the abnormal and blennoid structure of the ventrals, and the absence of the vomerine or palatine teeth, the *Dactyloscopinæ* appear to be almost as much related to the *Leptoscopinæ*, as the latter are to the *Uranoscopinæ*, properly so called. The comparison between the two former has been instituted on account of their close external resemblance, and not because they are believed to be very nearly allied to each other.

Catalogue of Birds collected on the Rivers Camma and Ogobai, Western Africa, by Mr. P. B. Duchaillu, in 1858, with notes and descriptions of new species.

BY JOHN CASSIN.

(Continued.)

129. Lamprocolius splendidus, (Vieill.)

Turdus splendidus, Vieill. Ency. Meth. i. p. 653.
Lamprotornis chrysonotis, Sw. B. of W. Afr., i. p. 143, (1837.)
Sw. B. W. Afr. i. pl. 6.

Apparently a common species in the country on the banks of the Camma and Ogobai. ♂ young. Upper parts lustrous metallic green, under parts dull black with a few lustrous green and purple feathers on the flanks and under tail coverts.

130. Lamprocolius purpureiceps, (J. and E. Verreaux.)

Lamprotornis purpureiceps, J. and E. Verreaux, Rev. et Mag. Zool., 1851, p. 418.

Specimens from the Ogobai and Rembo, and formerly from the Muni and Moonda.

131. Hyphantornis textor, (Gmelin.)

Oriolus textor, Gm. Syst. Nat. i. p. 392.
Buff. Pl. Enl. 375, 376. Sw. Zool. Ill., i. pl. 37.

Specimens from the Camma and Ogobai, and formerly from the Moonda, are not to be distinguished from others in the Acad. Coll. from Gambia. This species appears to be common in Equatorial Africa.

132. Hyphantornis cinctus, nobis.

Resembling *H. textor*, but smaller and with a wide transverse band of chestnut on the breast. ♂ Head and throat black, which color ends in a point on the breast, upper part of body greenish yellow, feathers on the back black at base, quills and upper coverts of wings brownish black edged with yellow, uniform with the back, tail uniform yellowish green, all the feathers edged with yellow. Wide band on the breast chestnut, extending somewhat on the sides, and in a narrow band around the back of the neck, abdomen and under tail coverts yellow, axillaries yellow, under wing coverts brownish black, tipped and edged with yellow. Bill bluish black, feet light colored. ♀ Head above yellowish green, throat, cheeks and line over the eye greenish yellow, upper parts of body ashy brown, all the feathers edged with a paler shade of the same color, quills and wing coverts brownish black edged with pale greenish yellow. Under parts dull ashy white, tinged with pale brownish on the breast, tibiæ and under tail coverts pale yellowish white, bill light bluish brown, under mandible paler, feet light colored.

Total length about 6 inches, wing 3¼, tail 2¼ inches. Female, total length about 5¾ inches.

Hab.—Camma River, Western Africa. Discovered by Mr. P. B. Duchaillu.

The present and the preceding species are strictly of the same subgeneric group, and resemble each other in colors and general characters, but the present bird is strongly characterized by the large space of chestnut color on the breast, which assumes the form of a wide transverse band, and is uniformly presented in several specimens in the collection from the Camma. It is smaller than the preceding.

This bird seems to be nearly related to *Ploceus collaris*, Vieillot, Nouv. Dict. xxxiv., p. 129, Ency. Meth. ii. p. 699, but has not the tail feathers black, as stated in all descriptions of that species, nor the breast rufous as stated also, and differs in other characters. It also appears to be related to *P. capitalis*, Lath. Gen. Hist. vi., pl. 94, but not so closely as to render it necessary to point out distinctive characters.

133. Hyphantornis flavigula (Hartlaub.)
Ploceus flavigula, Hartl. Rev. Zool., 1845, p. 406.
Hyphantornis Grayi, Verreaux, Rev. et Mag. Zool., 1851, p. 514.

Specimens in all of Mr. Duchaillu's collections agreeing precisely with the descriptions above cited are constantly labelled as males and females of the same species. It is apparently the most abundant bird of this group in Equatorial Western Africa. Specimens from the Ogobai and Rembo, and formerly from the Muni, Moonda and Cape Lopez.

134. Hyphanturgus personatus, (Vieillot.)
Ploceus personatus, Vieill.
Ploceus melanotis, Swains. Anim. Menag.
Vieill. Gal. ii. pl. 84. Jard. Contr. 1849, pl. 7?

Two specimens only from the Camma present some differences compared with numerous others in the Acad. Coll. from more northern localities, "Senegal," "Gambia," &c., but may not be distinct. A careful investigation might, however, be a good investment for an enterprising ornithologist.

Jardine's figures, cited above, represent nothing accurately with which I am acquainted, and seem, moreover, to have been prepared from specimens preserved in alcohol, which is especially liable to change yellow colors. The species may not be the present.

135. Foudia erythrops, (Hartlaub.)
Ploceus erythrops, Hartl. Rev. Zool., 1848, p. 109.
Quelea capitata, DuBus. Bull. Acad. Brussels, 1855,
Trans. Nat. Hist. Soc. Hamburg, 1848, pl. 8.

Numerous specimens of both sexes and various ages are in the collection from the Camma, and formerly from the Moonda. The description and figures by Dr. Hartlaub above cited, are of the female and young male, but the adult male and female and the young are accurately described by him in Orn. W. Afr., p. 129. The adult male has the entire head red, which color in the young male is restricted to the frontal and other plumage at the base of the bill.

136. Nigrita canicapilla, (Strickland.)
Aethiops canicapillus, Strick., Proc. Zool. Soc. London, 1841, p. 30.
Fraser, Zool. Typ. Birds, pl. 48.

Specimens labelled as males only from the Camma and Moonda. The adult male is described and figured as above.

137. Nigrita luteifrons, J. and E. Verreaux.
Nigrita luteifrons, Verr. Rev. et Mag. Zool., 1851, p. 420.

Strictly congeric with the preceding, but smaller. All the specimens in the present collection are labelled as males, which in its adult plumage is described by Messrs. Verreaux as above.

Young ♂. Entire plumage bluish cinereous or plumbeous, paler on the under parts of the body. Wings and tail black, under tail coverts tinged with pale rufous. No trace of the black of the under parts of the body which is in the adult bird. From the Camma.

138. Nigrita fusconota, Fraser.
Nigrita fusconota, Fras. Proc. Zool. Soc., London, 1842, p. 145.
Fraser, Zool. Typ. Birds, pl. 49.

Some exercise of the imagination is required in rating this bird in the same genus as the two preceding. The male is figured as above, and that sex only is represented in the present collection from the Camma. A single specimen was formerly received from the Moonda.

This bird probably belongs to a group of which, perhaps, *Estrelda* is the type, and seems to represent a subgenus, or perhaps a genus, certainly quite distinct from *Nigrita.*

139. Nigrita bicolor, (Hartlaub.)
Pytelia bicolor, Hartlaub, Cat. Bremen Mus., p. 76.
Nigrita bicolor, Sclater Jard. Contr. 1852, p. 34, pl. 83.

Scarcely of this genus, but more nearly related to the immediately preceding. This species is in Dr. MacDowell's collection from St. Paul's river, and it has now been received in several of Mr. Duchaillu's collections.

Specimens labelled as of both sexes are much alike, and the adult bird is intended to be represented in the plate above cited, but the bill is given too short and entirely erroneously. The bill is somewhat lengthened, with the commissure curved.

Young ♂. Upper parts dull ashy brown, darker on the rump and upper tail coverts, neck before and breast dull reddish ashy brown, abdomen and under tail coverts clear ferruginous. Wings and tail brownish black. From the Camma and formerly from the Moonda.

140. Sycobius cristatus (Vieillot.)
Malimbus cristatus, Vieill.
Tanagra malembica, Daud. Ann. Mus., Paris, ii. p. 148, pl. 10.
"Sycobius nigrifrons, Temm." Hartl. Cat. Jour., 1855, p. 356.
Shaw Nat. Misc. pl. 581, Vieill. Ois. Chant. pl. 42.

Several specimens of both sexes from the Camma and formerly from the Muni.

141. Sycobius malimbus, (Temminck.)
Textor malimbus, Temm.
Ploceus rubricollis, Swains. An. Menag., p. 306.
Malimbus cristatus, Vieill. (female).
Vieill. Ois. chant. pl. 43.

One specimen only from the Camma, and another was formerly received from Cape Lopez. Appears to be a distinct species and is at least not identical with *Euplectes rufovelatus*, Fraser, Zool. Typ. pl. 46.

142. SYCOBIUS SCUTATUS, Cassin ?
Sycobius scutatus, Cassin, Proc. Acad. Philada. 1848 p. 67 ?
Jour. Acad. Philada. i. pl. 41, fig. 1, 2.

A single specimen, from the Ogobai. This and another formerly received from Cape Lopez are not in mature plumage, but much resemble the species designated.

143. SYCOBIUS NITENS (J. E. Gray).
Ploceus nitens, J. E. Gray, Zool. Misc., p. 7, (1842.)
Gray, Gen. i. pl. 87, fig. 2.

Numerous specimens from the Camma and formerly from the Muni and Moonda.

144. SYCOBIUS NIGERRIMUS (Vieillot).
Ploceus nigerrimus, Vieill.
Ploceus niger, Swains. An. Menag. p. 306.

Several specimens from the Camma and formerly received from the Moonda and Cape Lopez. Perhaps not properly of this genus, the green color of the young approximating it to *Ploceus* and *Hyphantornis*.

145. VIDUA PRINCIPALIS (Linnæus.)
Emberiza principalis, Linn. Syst. Nat. i. p. 313.
Vidua erythrorhynchus, Swains. B. of W. Afr. i. p. 176, pl. 12.
Buff. Pl. Enl. 8, fig. 2. Vieill. Ois. Chant. pl. 36. Edwards' Bird, vi. pl. 270, fig. 2.

Numerous specimens, but generally in young plumage. From the Ogobai and formerly from the Moonda. The adult male of this species is described and figured as above, but Edwards' figure represents rather an immature plumage.

♂ young. Entire plumage dull brown, without stripes or spots, paler on the under parts and nearly white on the throat. Bill yellow or red at base and tipped with black. Tail short.

♀ adult. Upper parts striped longitudinally with brownish black and dull light ferruginous, under parts ashy white, tinged with dull reddish on the breast. Tail short, tertiary quills nearly as long as the primaries. Total length about 4¼ inches, wing 2½, tail 1¾ inch.

146. COLIOSTRUTHUS MACROURUS, (Gmelin.)
Loxia macroura, Gm. Syst. Nat. i. p. 845.
Fringilla flavoptera, Vieill.
Vidua chrysonota, Swains. B. of W. Afr. i. p. 178.
Buff. Pl. Enl. 183, fig. 1. Vieill. Ois. Chant. pl. 41.

This is a most anomalous and multiform species at different ages, and might very readily be mistaken for several distinct birds. Vieillot, as above, represents the adult male, which is well described by various authors ; Buffon's figure seems to be intended for this bird, but if so, is a failure.

♀ adult ? Tail short, entire upper parts dull ashy brown, every feather having a central longitudinal stripe of brownish black, which stripes are wider on the back. Under parts dull white, tinged with dull yellowish on the breast and the feathers on the breast and sides having a few longitudinal stripes of dark brown. Wings and tail dark brown, coverts at the shoulder edged narrowly with yellow, bill and feet light colored. Total length 5 inches, wing 2¾, tail 2 inches.

♂ young. Tail long, shoulders bright lemon yellow, wings and tarsi black. Upper parts of head and body with the feathers black in the middle and widely tipped and edged with dull reddish ashy, under parts dull ashy white, obscurely striped on the breast and sides with light brown. ♂ younger. Tail short, generally resembling the female, but with the upper parts more strongly tinged with dull reddish, and the stripes narrower. Under parts dull and pale greenish yellow, darker on the breast. Bill and feet light colored.

Of the plumage supposed by me to be the adult female and so labelled in the present collection, there may be an error. It is quite possible that the adult female is black, like the male. The female of this species described above is in general appearance not unlike that of some species of *Carpodacus*.

Numerous specimens from the Camma and formerly from Cape Lopez.

147. SPERMOSPIZA GUTTATA, (Vieillot).
Loxia guttata, Vieill.
Vieill. Ois. Chant. pl. 68, (female).

About twenty specimens received from Mr. Duchaillu are all of this species, and are in adult plumage. As yet no specimen of the nearly allied *S. hæmatina* has ever been received in this Academy from Equatorial Africa, though frequent in collections from the Gambia.*

Specimens from the Camma and formerly from the Moonda.

---

* The two species of the genus *Spermospiza*, G. R. Gray, singularly resemble each other in general characters, but are quite distinct and recognizable without difficulty.

1. SPERMOSPIZA HÆMATINA, (Vieillot).
Loxia hæmatina, Vieill.
Spermophaga cyanorhynchos, Swains. B. of W. Afr. i. p. 164.
Fringilla pustulata, Voigt.
Vieill. Ois. Chant. pl. 67. Jard. & Selby, Ill. Orn. n. s. pl. 11.

♂ Adult. Chin, sides of neck, cheeks, head above and entire upper parts of body, wings and tail glossy black, frequently tinged with brown, especially on the wings. Throat, neck, breast and sides scarlet, middle of abdomen, tibiæ and under tail coverts black. Bill shining metallic blue, tipped with bright red. Upper tail coverts black, uniform with other upper parts. ♀ Adult. Head above and upper parts of body dark brownish ashy, throat, neck before, breast and sides scarlet, cheeks and forehead dull red, upper tail coverts brick red. Abdomen dark ashy brown, with numerous circular spots of white. ♀ Young. Entire plumage brownish black, lighter on the under parts of the body, and with a few scarlet feathers on the breast, and of dull red on the upper tail coverts.

Total length about 5½ inches, wing 2¾, tail 2½ inches. ♀. Total length 5¼ inches.

Hab.—"Senegal." "Gambia." Acad. Collection.

This bird has the cheeks and a narrow space at the base of the under mandible, (or chin) and the rump and upper tail coverts always black in the adult male, by which characters it is easily distinguished from the succeeding. The females of the two species are, however, very much alike, both having the upper tail coverts red or scarlet. In the female of the present bird the circular spots on the abdomen are smaller and more numerous than in the succeeding.

In the Acad. Coll., specimens of this species are from more northern locations than of the succeeding.

2. SPERMOSPIZA GUTTATA, (Vieillot).
Loxia guttata, Vieill. Ois. Chant.
Vieill. Ois. Chant. pl. 68. (♀). Lath. Gen. Hist. v. pl. 87, (♀).

♂ Adult. Much resembling the preceding, but with the chin, cheeks, throat and breast bright scarlet, which also is the color of the upper tail coverts. All other parts of the plumage black, generally tinged with brown on the abdomen. Bill shining metallic blue, both mandibles edged and tipped with red. ♀ Adult. Upper parts dark brownish ashy, upper tail coverts scarlet, throat, cheeks, (enclosing the eyes) breast and sides bright scarlet, abdomen brownish black, with numerous circular spots of white. ♂ Young.

148. **PYRENESTES COCCINEUS**, Cassin.
Pyrenestes coccineus, Cassin, Proc. Acad. Philada. 1848, p. 67.
Jour. Acad. Philada. i. pl. 30, fig. 2.

Specimens generally in young plumage. There are also in the present collection two specimens evidently in quite immature plumage, which have the bills so much weaker that I suspect they belong to a different species.

From the Camma and formerly from the Moonda.

149. **ESTRELDA RUBRIVENTRIS**, (Vieillot).
Fringilla rubriventris, Vieill.
Estrelda occidentalis, Jardine and Frazer, Cont. Orn. 1851, p. 156?
Vieill. Ois. Chant. pl. 13.

Several specimens in adult plumage from the Camma and Ogobai.

150. **ESTRELDA MELPODA**, (Vieillot).
Fringilla melpoda, Vieill.
Vieill. Ois. Chant. pl. 7.

Numerous specimens from the Camma, and formerly from Cape Lopez.

151. **ESTRELDA ATRICAPILLA**, J. & E. Verreaux.
Estrelda atricapilla, Verr. Rev. et Mag. Zool. 1851, p. 421.

From the Camma, and formerly from the Muni and Moonda.

152. **SPERMESTES POENSIS**, (Fraser).
Amadina poensis, Fraser, Proc. Zool. Soc. London, 1842, p. 145.
Fraser, Zool. Typ. pl. 50, fig. 1.

Frequently received in Mr. Duchaillu's collections. From the Camma, and formerly from the Moonda.

153. **SPERMESTES CUCULLATA**, Swainson.
Spermestes cucullata, Sw. B. of W. Afr., i, p. 201.
Von Müller, Beitr. Orn. Afr. pl. 16.

Numerous specimens from the Ogobai and Rembo, and formerly from the Moonda and Cape Lopez.

154. **ORTYGOSPIZA ATRICOLLIS**, (Vieillot).
Fringilla atricollis, Vieill.
Fringilla polyzona, Temm. Pl. Col. 221, fig. 3?

Specimens from the Camma, like others formerly received from Cape Lopez, have no trace of white on the throat nor around the eyes, though in all respects they agree precisely with Vieillot's description cited above. In seven specimens in the Acad Coll. labelled "*F. polyzona*, Temm. Gambia," the white markings are invariably present as represented in Temm. Pl. Col. 221, fig. 3.

155. **FRINGILLARIA TAHAPISI**, (Smith).
"Emberiza tahapisi, A. Smith." Mr. Verreaux's label.

Entire plumage dull brownish black except the upper tail coverts which are brick red, and a few feathers on the throat and breast which are scarlet.

Total length about 5½ inches, wing 2¾, tail 2¼ inches. Female rather smaller.

Hab.—Equatorial Africa. Rivers Moonda and Camma. (Mr. Duchaillu).

The adult males of these two species are easily distinguished by the chin, cheeks, and upper tail coverts being black in the first, and scarlet in the second species, though they are very similar in size and general appearance. The young males also are much alike, but that of *S. guttata* may always be recognized by the upper tail coverts being dull red. The females are more difficult to distinguish, both having the upper tail coverts scarlet or red in all ages. In the female of *S. hæmatina*, the red color of the cheeks frequently extends over the frontal feathers, completely inclosing the base of the bill, which characters I have never seen in that of *S. guttata.*

Specimens from the Camma, and formerly from Cape Lopez.

156. Passer Swainsonii, (Rüppell).
Pyrgita Swainsonii, Rüpp. Faun. Abyss.
Pyrgita simplex, Sw. B. of W. Afr. i. p. 208.
Rüpp. Faun. Abyss. pl. 33, fig. 2.

157. Corythaix meriani, Rüppell.
Corythaix Meriani, Rüpp. Wiegm. Arch. xvii., p. 319.
Corythaix Verreauxii, Schlegel, Cab. Jour.
" Corythaix persa." Cassin, Cat. of B. from Cape Lopez.

Specimens from the Camma and Ogobai and formerly in all of Mr. Duchaillu's collections. Appears to be a common bird in Equatorial Africa.

158. Turacus giganteus, (Vieillot.)
Musophaga gigantea, Vieill.
Corythaix gigas, Stephens.
Crax cyanea, J. E. Gray.
Le Vaill. Prom. pl. 19.

Specimens from the Camma and formerly from the Moonda. ♂ young. Head without a crest, throat naked, bill dull black, colors generally as in adult but duller, top of head black.

159. Buceros atratus, Temminck.
Buceros atratus, Temm. Pl. Col. ii., (liv. 94.)
Buceros poensis, Fraser, Ann. and Mag. Nat. Hist., 1855, p. 136.
Temm. Pl. Col. 558.

Both sexes from the Ogobai.

160. Buceros cylindricus, Temminck.
Buceros cylindricus, Temm. Pl. Col.
Temm. Pl. Col. 521.

A single specimen of the male in adult plumage from the Camma.

161. Buceros fistulator, Cassin.
Buceros fistulator, Cassin, Proc. Acad. Philada. 1850, p. 68.
"Buceros leucostigma, Temm. Mus. Lugd." Hartl. Orn. W. Afr. p. 162.

The young male or the female is described by me as above, and only in the present collection have I ever seen the adult. It is larger than the dimensions given in the description above referred to, but smaller than *B. buccinator*, Temminck, which it resembles, though quite distinct.

♂ Adult. Two middle feathers of the tail, black, all the others white. Head crested, the feathers of which are wide and rounded at the end. Head, breast, sides and upper parts of body black, with a greenish lustre, rump, upper and under tail coverts and abdomen, white. Primary quills black, secondaries entirely white, tertiaries black tipped with white, under wing coverts white. Bill with its upper segment distinct but small, under mandible rugose, (bill pale yellow in dried skin, under mandible with a large space in the middle brownish black.)

Total length about 21½ inches, wing 9¾, tail 8, bill 4, lateral width of bill 2 inches.

Hab.—Rivers Camma, Muni and St. Paul's, Western Africa. Mus. Acad. Philada.

162. Berenicornis albocristatus, (Cassin.)
Buceros albocristatus, Cassin, Proc. Acad. Philada.
" Buceros macrourus, Temm. Mus. Lugd." Hartl. B. of W. Afr., p. 163.
Jour. Acad. Philada. i. pl. 15.

Numerous specimens from the Camma and formerly from the Muni and Moonda. The description and figure as above is of the adult. In the younger bird the cheeks are frequently black, and the quills and wing coverts widely tipped with white.

163 TOCKUS FASCIATUS, (Shaw.)
Buceros fasciatus, Shaw.
Le Vaill. B. of Afr., pl. 233.

From the Camma and Ogobai and formerly from the Moonda and Cape Lopez Apparently the most abundant bird of this family in Equatorial Africa.

164. TOCKUS CAMURUS, Cassin.
Tockus camurus, Cassin, Proc. Acad. Philada. 1856, p. 319.

Several specimens from the Camma not different in any considerable degree from those formerly received from Cape Lopez. This is the smallest species of the group of *Buceros*.

165. PSITTACUS PACHYRHYNCHUS, Hartlaub.
Psittacus pachyrhynchus, Hartl. Verz. Mus. Brem. p. 88.
Psittacus magnirostris, Bonap. Consp. i. p. 5.
Psittacus Le Vaillantii, Lath. Ind. Orn. Supp. p. 23?

Several specimens in adult plumage from the Camma and also from the Mnni.

166. POGONIAS HIRSUTUS, Swainson.
Pogonias hirsutus, Swains. Zool. Ill. ii. pl. 72.

Specimens from the Camma and Ogobai and formerly from the Moonda.

167. BARBATULA DUCHAILLUI, Cassin.
Barbatula Duchaillui, Cassin, Proc. Acad. Philada. 1855, p. 324, (April.)
Buccanodon formosus, Verreaux, Rev. et Mag. Zool. 1855, p. 218, (May.)
Rev. et Mag. Zool. 1855, pl. 5.

Specimens from the Camma.

168. BARBATULA SUBSULFUREA, (Fraser.)
Bucco subsulfureus, Fraser, Proc. Zool. Soc. London, 1843, p. 3.
Fraser, Zool. Typ. pl. 52.

From the Ogobai and formerly from the Moonda.

169. BARBATULA SCOLOPACEA, (Bonaparte.)
Xylobucco scolopacea, Bonap. Consp. Av. i. p. 141.
"Bucco scolopaceus, Temm. Mus. Lugd." Bonap. as above.
Barbatula stellata, Fraser, Proc. Zool. Soc. London, 1843, p. 4?

Numerous specimens which appear to be this species, but apparently not mature. From the Camma and Moonda.

170. GYMNOBUCCO CALVUS, (Lafresnaye.)
Bucco calvus, Lafres. Rev. Zool.. 1841, p. 241.

A specimen in the present collection seems to be this species, though the dimensions are rather larger than as given in the description above cited.

From the Ogobai.

171. GYMNOBUCCO FULIGINOSA (Cassin.)
Barbatula fuliginosa, Cassin, Proc. Acad. Philada., 1855, p. 324.
Gymnobucco Bonapartei, Verreaux, Cab. Jour., 1855, p. 102?

Numerous specimens have now been received from Mr. Duchaillu, not one of which has the head above or any portion of it naked, nor are they in several other respects as described by Mr. Verreaux as above. My present opinion is that ornithologists are in error in regarding the two names above cited as synonymous. Sexes alike, and presenting no other characters than as given by me in the description referred to above.

From the Camma and Ogobai and formerly from the Moonda.

A fine specimen of *Gymnobucco Peli*, Hartlaub, is in the Acad. Coll., having been received from the Leyden Museum through the kindness of the late illustrious naturalist, Temminck. It is specifically quite distinct from either of the species here given, though the investigation of the birds of this curious genus is not without difficulties.

172. **Trachyphonus purpuratus**, Verreaux.
Trachyphonus purpuratus, J. & E. Verreaux, Rev. et Mag. Zool. 1851, p. 260.

Apparently not rare in Equatorial Africa. From the Camma and formerly from the Moonda.

173. **Dendropicus gabonensis**, (J. & E. Verreaux.)
Dendrobates gabonensis, Verr. Rev. et Mag. Zool. 1851, p, 513.

Numerous specimens from the Camma, nearly all of which, however, appear to be immature.

174. **Dendropicus nigriguttatus**, (Verreaux.)
Dendromus nigriguttatus, Verreaux.

From the Camma and Ogobai, and formerly from the Moonda.

175. **Dendromus Caroli**, (Malherbe.)
Chloropicus Caroli, Malh. Rev. et Mag. Zool. 1852, p. 550.

Appears to be the most abundant woodpecker in Equatorial Western Africa. From the Camma and formerly from the Moonda and Cape Lopez.

176. **Dendromus brachyrhynchus**, Swainson.
Dendromus brachyrhynchus, Swains. B. of W. Afr. ii. p. 160.
"Picus chloronotus, Cuvier," Pucheran, Rev. et Mag. Zool. 1852, p. 479.

Several specimens which appear to be this species, from the Camma.

177. **Dendromus nivosus**, Swainson.
Dendromus nivosus, Swains. B. of W. Afr. ii. p. 162.

Specimens from the Camma and Ogobai.

178. **Dendromus africanus**, (Gray) ?
Picus africanus, Gray, Zool. Misc., p. 18, (1831) ?

Both sexes of a species much resembling that described as above, but, unfortunately, not in mature plumage. This bird belongs to the same group as *Picus namaquus*, Lichtenstein, Le Vaill. Ois. d'Afr. vi., pl. 251, 252, (which is the same as *P. mystaceus*, Vieill. and *P. biarmicus*, Cuvier,) and *Dendrobates schoensis*, Rüppell, Syst. Ueber, pl. 33.

It is very probably the species described by Gray, as above, but I prefer inserting it doubtfully, hoping to receive mature specimens. From the Camma, and formerly from Cape Lopez.

179. **Dendromus.**

In addition to the preceding species of Woodpeckers, there are several others in Mr. Duchaillu's collections, and especially in the present, from the Camma, which are at least not easily referable to known species. In fact, though with a large majority of known African species before me, in the Acad. Coll., the investigation of the Woodpeckers alone in this collection has required so much time, that I am under the necessity of abandoning it, without satisfactory conclusions, so far as relates to several species.*

---

* The following species of *Picidæ*, from Western Africa, are in the Academy collection:

1. Dendropicus minutus, (Temminck).
2. Dendropicus obsoletus, (Wagler).
3. Dendropicus gabonensis, (Verreaux).
4. Dendropicus goertan, (Gmelin).
5. Dendropicus poliocephalus, (Swainson).
6. Dendropicus immaculatus, (Swainson).
7. Dendropicus pyrrhogaster, (Malherbe).
8. Dendromus punctiligerus, (Wagler).
9. Dendromus chrysurus, Swainson.
10. Dendromus brachyrhynchus, Swainson.

180. Indicator maculatus, G. R. Gray.

Indicator maculatus, G. R. Gray, Gen. of B. ii., pl. 113.

Two specimens from the Ogobai, labelled as male and female, are precisely as given by Mr. Gray in his excellent figure above cited, and are the first that have ever come under my notice. This bird is certainly not the young of *I. major*, to which authors seem inclined to assign it, though that species is also spotted on the under parts in young plumage.

181. Melignothes exilis, Cassin.

Melignothes exilis, Cassin, Proc. Acad., Philada., 1856, p, 157.

Two other specimens in adult plumage, and corresponding in all respects with that described by me, as above. From the Camma.

182. Hetærodes insignis, Cassin.

Hetærodes insignis, Cassin, Proc. Acad., hilada., 1856, p. 157.

One specimen only quite similar to that from the Moonda, described as above cited. From the Camma.

183. Centropus Francisci, Bonaparte ?

Centropus Francisci, Bonap. Consp. Av. i. p. 107 ?

A large species, the specimens of which are probably not in mature plumage, but much like the descriptions cited above and given by Dr. Hartlaub. From the Camma.

184. Centropus monachus, Rüppell.

Centropus monachus, Rüpp. Neüe Wirb. Birds, p. 57, pl. 21, fig. 2.

Specimens in mature plumage quite identical with others from North Eastern Africa, in the Academy collection. From the Camma.

185. Zanclostomus aereus, (Vieillot).

Cuculus aereus, Vieill. Ency. Meth., p. 183.

Zanclostomus flavirostris, Swains. B. of W. Afr. 12, p. 183.

Le Vaill. Ois. d'Afr., pl. 215, Swains. B. of W. Afr. ii. pl. 19,

Evidently an abundant species. From the Ogobai and Rembo, and formerly from the Moonda.

186. Cuculus gabonensis, Lafresnaye.

Cuculus gabonensis, Lafres. Rev. et Mag. Zool., 1853, p. 60.

Two species in mature plumage from the Camma.

187. Chrysococcyx smaragdineus, (Swainson).

Chalcites smaragdineus, Swains. B. of W. Afr. ii. p. 191.

In young plumage, and the only specimen of any species of this genus received from Mr. Duchaillu. From the Camma.

---

11. Dendromus nigriguttatus, Verreaux.
12. Dendromus Caroli, (Malherbe).
13. Dendromus nivosus, Swainson.
14. Dendromus africanus, (Gray) ?

In addition to which, are several undetermined species, and numerous specimens of a little species in the Rivoli collection, labelled "*Picus senegalensis*," with the locality occasionally added, "Senegal." The latter appears to be the species described by Gmelin under this name, and figured by Buffon, Pl. Enl. 345, fig. 2, but may not be an African bird. It apparently belongs to the same generic group as species labelled "*P. affinis*," "*Mesopicus Cecilii*," and others in the Academy collection.

Properly, these birds belong to various groups or genera, and several of them have strongly allied forms in Eastern Africa, and the same latitudes in Asiatic Islands.

188. Treron nudirostris, (Swainson).
Vinago nudirostris, Swains. B. of W. Afr. ii. p. 205.
Bonap. Hist. Nat. Pigeons, pl. 3.
Received in all of Mr. Duchaillu's collections. From the Camma and Ogobai.

189. Columba Malherbei, Verreaux.
Columba Malherbii, Verr. Rev. et Mag. Zool., 1851, p. 514.
"Columba chalcauchenia, Gray," Hartl. Orn. W. Afr., p. 194.
Both sexes in mature plumage from the Camma.

190. Columba iriditorques, Cassin.
Columba iriditorques, Cassin, Proc. Acad. Philada., 1856, p. 157.
Numerous specimens from the Camma. Sexes alike.

191. Columba unicincta, nobis.

♂ Head above and neck light cinereous, back and upper wing coverts dark lead color, every feather edged with light bluish cinereous, giving a squamose or scale-like character to those parts; rump and upper tail coverts dark lead color more obscurely edged with bluish ashy. Upper parts pale vinaceous, nearly white on the throat and pale ashy on the sides and flanks, middle of abdomen, tibiæ, and under tail coverts white. Quills ashy black, narrowly edged externally with white; tail dark lead color, nearly black, with one wide transverse band of white across the middle of all the feathers. Under wing coverts dark cinereous. Bill dark greenish at base; tip of both mandibles yellow; feet black or horn color. A large, naked space around the eye red or dark yellow.

Total length about 13 inches, wing 8, tail 5 inches.

Hab.—River Ogobai, Western Africa. Discovered by Mr. P. B. Duchaillu.

A single specimen labelled as a male of this species is in the collection from the Ogobai, and I have failed to identify it with any species or description which has come under my notice; nor does it resemble any other species known to me in such degree as to render it necessary to point out comparative distinctions. It seems to belong to the group *Palumbus*, though it appears to me to approach *Carpophaga* more nearly than any species that I have yet seen from Africa, and its general appearance is somewhat like that of the plainer species of that group (*C. cineracea*, *rosacea* and others). It is entirely without any white or black collar, or other markings on the neck, and the present specimen has no metallic tint whatever on any part, though having all the characters of an adult bird.

Though of very plain colors, this is a large and handsome species, and I regard it as one of the most interesting birds in the present collection. A single specimen only is from the River Ogobai.

192. Turtur erythrophrys, Swainson.
Turtur erythrophrys, Swains. B. of W. Afr. ii. p. 207, pl. 22.
Numerous specimens from the Camma, and formerly from the Moonda.

193. Peristera tympanistria, (Temminck).
Columba tympanistria, Temm. Pig., pl. 36.
Le Vaill. Ois. d'Afr. vii., pl. 272.
Specimens from the Camma, and formerly from the Muni.

194. Peristera puella, Schlegel.
Peristera puella, Schleg. Beydr. Dierk, i. p. 19, pl. 6.

Specimens of this beautiul species are from the Camma and Ogobai, and formerly from the Muni. The adult male is represented in the very handsome figure cited above, but the sexes are not to be distinguished, except by the rather smaller size and duller colors of the female.

195. PERISTERA AFRA, (Linnæus).
Columba afra, Linn. Syst. Nat. i. p. 284, (1766).
Rüpp. Syst. Uebers., pl. 38, Buff. Pl. Enl. 160.

Apparently an abundant species on the Camma and Ogobai, and formerly received in Mr. Duchaillu's collections, from the Moonda and Muni. This seems to be the species figured by Rüppell, as above and described by that author and others, as *C. chalrospilos.*

196. PERISTERA CHALCOSPILOS, (Wagler).
Columba chalcospilos, Wagler, Syst. Av. sp. 83, (1827).
Le Vaill Ois. d'Afr. vii., pl. 271.

Two species very nearly allied have been received in Mr. Duchaillu's collection from the Camma. The present bird has the spots on the quills constantly lustrous metallic green, not purple, as in the preceding. It appears to be the species indicated by the Prince Bonaparte, under the name here adopted in Conspectus Avium ii. p. 68, though not agreeing with his description in all particulars.

[To be continued.]

Notes on a Collection of Japanese Fishes, made by Dr. J. Morrow.

BY THEO. GILL.

The collection of Japanese fishes, which it is now proposed to notice, has been submitted to us by Prof. Baird, of the Smithsonian Institution, and was formed during the expedition to Japan, under the command of Commodore Perry. It contains specimens of eighteen species, six of which are believed to be new. All the remaining, with exception of two species, (*Gasterotokeus biaculeatus* of Heckel and *Amphiprion frenatus*, Brevoort,) have been previously described as inhabitants of Japan, by Temminck and Schlegel, in the Ichthyological portion of the Fauna Japonica.

ACANTHOPTERYGII Cuv.

SCORPÆNOIDÆ Sw., Girard.

APISTINÆ Gill.

1. Gymnapistes rubripinnis.

Apistus rubripinnis Tem. and Schl. Fauna Japonica, Pisces, p.49, pl.xxii. fig. 2.

Apistus rubripinnis Brevoort, Notes on figures of Japanese Fish, p. 10, ib. in Narrative Expedition to Japan, vol. 2, p. 262, pl. vi. fig. 5.

This fish belongs to Swainson's genus Gymnapistes, established for those species of the Apistus of Cuvier which are destitute of scales, and all of whose pectoral rays on each side are connected by the membrane and form a single entire fin.

Swainson has entirely perverted the name of Apistus, or Apistes as it is spelled by him, by applying it to Cuvier's genus Minous, which latter name he has probably abolished on account of its barbarous origin. As the barbarity of a name is not sufficient to authorize such an act, Minous must be restored to the genus for which it was first used, and Apistus may be retained for the first Cuvieran section of the group embraced under that name.

MONOCENTROIDÆ Gill.

The peculiar and cavernous nature of the bones of the head and the large osseous shields of the body appear to detach the genus Monocentris from the other families of the Cataphracti.

Monocentrinæ Gill.

2. Monocentris Japonicus.

Monocentris Japonicus Brevoort, Notes on Figures of Jap. Fish, p. 10; ib. in Narrative Expedition to Japan, vol. 2, p. 262, pl. vi. fig. 6.

A single specimen of this fish is in the collection of Dr. Morrow. The figure accompanying the above cited memoir of Mr. Brevoort is a very accurate representation of its form. In spirits, the plates are of a brown brass color, and the interspaces are blackish. The specimen is of the size figured in the plate. Is there more than one species of the genus? or does the young differ in form from the adult?

Scombroidæ Cuv.

Trichiurinæ Bon.

3. Trichiurus Japonicus.

Trichiurus Japonicus Blkr. Verhand. von Batav. Genootschop, vol. 26, Nieuwe Nalez, Ich. Jap., p. 98. 1857.

This species has been fully described by Dr. Bleeker in his recent Memoir on the Fishes of Japan and their geographical distribution. One specimen was obtained by Dr. Morrow.

Echeneidoidæ Bon.

Echeneidinæ Bon.

4. Echeneis naucrates.

A single specimen of the species identified by Temminck and Schlegel with the Linnæan Echeneis naucrates was obtained by Dr. Morrow. It has twenty-four plates in its disc, and the sides of the caudal fin are posteriorly bordered with white.

Gobioidæ Cuv.

Gobinæ Bon., Gill.

5. Acanthogobius flavimanus.

Gobius flavimanus Tem. and Schl. Fauna Japonica, Pisces, p. 141, pl. lxxiv. fig. 1.

An individual of this species, five inches in length, was obtained by Dr. Morrow.

6. Rhinogobius similis Gill.—This fish has a great superficial resemblance to Acanthogobius flavimanus, but differs generically in the naked sides of the head and in the normal number of dorsal spines.

The head is as elongated as that of A. flavimanus, but is more gibbous between the eyes and jaws; it forms nearly a quarter of the entire length, inclusive of the caudal. The eyes are moderately large, and are placed midway between the snout and operculum. There are about twenty-eight scales in a lateral row on the side.

$$\mathrm{D\ vi,\ 1,\ 7}\ \frac{1}{1}\ \mathrm{A\ 1,\ 7}\ \frac{1}{1}\ \mathrm{C\ 9,\ 7,\ 7,\ 9,\ P\ 18,\ V,\ 1,\ 5+5,\ 1.}$$

The color is tawny, punctured with black above, and darker on the profile and operculum, and there is on each side a row of five large dark spots. The second dorsal is irregularly clouded; the other fins are immaculate.

This species would answer quite well to the description of Gobins Pflaumii of Bleeker, were it not for the elongated form of the head. It agrees with that species in the clear fins and in the number of scales on the sides.

The genera to which the two Gobinæ of this catalogue are referred, are fully described in a Memoir on the Gobinæ of the North Pacific Expedition, communicated to the Lyceum of Natural History of New York.

LUCIOGOBIUS Gill.

Body naked, elongated and slender, with the height nearly uniform to the caudal fin, anteriorly cylindrical; head depressed, above elongated oval, swollen on the sides, and with a central linear depression; eyes widely separated, entirely in the anterior half of the head, small and covered by the skin; mouth nearly horizontal, moderately large and extending under the eyes; teeth pluriserial on the jaw, largest in the external row, not passing to the corner of the mouth; vomer and palatine toothless; tongue large, free and deeply emarginated anteriorly; branchial apertures small, nearly vertical and anterior to the bases of the pectorals; branchiostegals four on each side; dorsal fin nearer the caudal than the head, single and oblong, preceded by one or two simple inarticulated rays; anal opposite the dorsal; caudal rounded; pectorals rounded, with the rays entirely connected by the membrane and with vertical bases; ventrals small, united in a simple infundibuliform basin, and each composed of a spine and five-branched rays; interspinal membrane low; lateral line obsolete.

This is the type of a very distinct tribe of the Gobioids, well characterized by the esociform position of the dorsal and anal fins, and by the very small number of simple rays. In the latter respect, they are represented in the other families of Acanthopterygians by Ophicephalus, Bl., Aphredoderus, Les., Ichthyoscopus, Sw., Aspidophoroides, Lac., Pseudochromis, Rup., &c.

In the form of the head it has a slight resemblance to *Triænophorus*, Gill.

7. L. guttatus Gill.—The body is much elongated and imperceptibly declines to the caudal fin. The height at the pectorals is between a twelfth and thirteenth of the extreme length, and near the caudal, it is rather more than a seventeenth of the same length.

The head is oblong oval above; it forms about two-ninths of the total length; its breadth equals five-ninths of the length, and is twice as great as the height.

The dorsal is situated slightly anteriorly to the sixth-tenth of the extreme length; it is oblong and sustained by two inarticulate and twelve branched rays. The anal is under the dorsal, and has thirteen rays, the first of which is small and inarticulate.

The body is brown, thickly punctured with black; the caudal, dorsal and pectoral fins are also dotted with black.

A single specimen of the length of two inches and a half is in the collection

BLENNOIDÆ Raf.

CENTRONOTINÆ Gill.

8. Centronotus subfrenatus Gill.—This species differs from the previously known Japanese species of the genus C. crassispinnis, (*Gunnellus crassispinnis* Temm. and Schlegel, Fauna Japonica, Pisces, p. 139,) C. nebulosus (*Gunnellus nebulosus*, T. S. l. c.,) and C. dolichogaster (*Gunnellus dolichogaster*, Brevoort,) by the presence of an almost vertical band, margined on each side by purplish-white, which passes from the lower border of the eye to the margin of the preopercle behind the lower jaw. A widely curved band of purplish-white with a row of black dots passes from eye to eye; the convexity of the curve is posterior. The body is reddish-brown with a dorsal band of black, and with a lateral row of large confluent black spots. The fins are immaculate, but the posterior margin of the caudal is white. The dorsal has from seventy-six to seventy-nine spines.

Several specimens of this species were obtained by Dr. Morrow, but only one of them is in a good state of preservation.

As the name of Centronotus was given to the Cuvieran Gunnelli before its application to a Scombroid genus by Lacepede, and subsequently by Mitchell, there is no reason why it should not be retained for the present genus.

Schneider has well restricted it in the Systema Ichthyologiæ of Bloch,* assigning to it the same essential characters as Cuvier himself.

AULOSTOMATOIDÆ Raf. 1810.

FISTULARIANÆ Bon.

9. Fistularia immaculata Comm.

Two small specimens of this species were obtained at Simoda.

PSEUDOCHROMIDOIDÆ Mull.

PSEUDOCHROMIDINÆ Gill.

10. Cichlops Japonicus Gill.—This species scarcely differs in general form from its congeners, and is very nearly allied to the C. cyclophthalmus of Muller and Troschel. It is chiefly distinguished from that species by the position of the bases of the ventrals, under the lower angles of those of the pectorals. The color is tawny, much darker in the centres of the scales on the back and on the sides above the pectorals. The posterior border of the orbit is margined by a black crescent. The dorsal has a few minute black dots. The membranous margin of the preopercle presents the appearance of being sustained by rays. There are about fifty-two scales in a longitudinal row along the sides.

D ii. 25, A iii. 14, C 6, 9, 8, 5, P 19, V i. 5.

The single specimen in the collection has a length of little more than four inches.

(PHARYNGOGNATHI Mull.)

POMACENTROIDÆ Bon.

POMACENTRINÆ Bon.

11. Pomacentrus dorsalis Gill.—The body is oblong oval, with its abdominal outline more arched than its dorsal. The head is small, and its outline from the nape to the snout is straight. The eye is large and near the profile. The suborbital has a simple, strong tooth directed horizontally backwards, and separated by a semi-elliptical sinus from the body of the bone. The suborbital beneath the eye has also one or two small vertical processes. There are about twenty-five scales in a longitudinal row on the side.

D xiii. 15, A ii. 15, C 3, 9, 8, 3, or 5, 1, 5, 6, 1, 5, P 18, V i. 5.

The color is brown, with one or two obscure bluish dots on each posterior scale of the sides. The operculum and preoperculum have a few more distinct ones, and there is also a distinct black dot at the scapular angle of the operculum. A large black spot, bordered anteriorly by bluish white, is on the posterior rays of the dorsal. There is a black dot at the upper angle of the base of the pectoral. The ventrals are purple; the caudal yellow towards the base.

One specimen is in the collection; its length is nearly three and a half inches.

12. Glyphidodon cœlestinus.—This species does not appear to have been previously found at Japan. Two specimens are in the collection of Dr. Morrow.

The G. smaragdinus Brevoort† appears to be quite distinct from this species, if the figure given in the Notes on Japanese Fish is correctly drawn. It is much higher than G. cœlestinus, the bands are not as distinct, and the first and last ones of G. cœlestinus are obsolete; it is still more distinguished by the absence of the longitudinal submarginal black bands of the caudal, so distinct in G. cœlestinus. The number of dorsal spines appears to be the same in both species.

---

*Corpus gracile, pinna dorsi longitudinalis, tota aculeata: Syst. Ich., Schneid., p. 165, 1801.

† Notes on some figures of Japanese Fish, p. 12, pl. vi. fig. 3; ibid. in Narrative Expedition to Japan, vol. 2, p. 264, pl. vi. fig. 3.

AMPHIPRIONINÆ Gill.

13. Amphiprion frenatus Brev.—Notes on figures of Japanese Fish, p. 11, ib. in Narrative Expedition to Japan, vol. 2, p. 263, pl. vi. fig. 4. 1856.

The color of this species, as preserved in alcohol, is very different from that of the living fish. The ground color is tawny. The oblique band behind the eye is purplish white, bordered on each side by black. There are nine spinous rays in the dorsal fin. The groups of radiating opercular ridges terminating in spines, and which are characteristic of the *Amphiprioninæ*, are perfectly distinct, although they are not shown in the above quoted figure.

Two specimens of the species were collected by Dr. Morrow.

LABROIDÆ Cuv.

LABRINÆ Bon.

14. Julis cupido Tem. and Schl.—One specimen is in the collection formed by Dr. Morrow.

15. Halichœres pyrrhogramma.

Julis pyrrhogramma Tem. and Schl., Fauna Japonica, Pisces, p. 170; pl. lxxxvi. fig. 2.

A single specimen is in the collection.

SYNENTOGNATHI Gill.

The abdominal Malacopterygian Pharyngognaths of Dr. Müller do not appear to belong to the same natural order as the Pomacentroids and allied fishes. If the coalescence or separation of the inferior pharyngeal bones is to be esteemed as of ordinal value, the two sections that have been confounded under the name of Pharyngognathi should be at least separated, and regarded as distinct orders. In such a case, the above name may be used to embrace the Exocœti, Scomberesoces, &c. There is so striking a parallelism between the genera of Acanthopterygian Pharyngognaths and the true Acanthopterygians, that a doubt may be even entertained whether the pharyngeals are of really ordinal value in classification. Certain it is, that no less than three genera that actually belong to the Pharyngognathi of Müller, were confounded by Cuvier himself with genera of the Mullerian Acanthopteri, Pterophyllum of Heckel being referred to Platax, Astronotus of Swainson to Lobotes and Amblodon of Rafinesque to Corvina. The connection of those respective genera appears, however, to be one of analogy rather than of affinity.

SCOMBERESOCES Mull.

HEMIRHAMPHINÆ Gill.

16. Hemirhamphus occipitalis Gill.—The height is scarcely contained twelve times in the length from the *upper jaw* to the end of the caudal fin. The head forms nearly a fifth of the same length, and its height is contained between two and two and a half times in its length. The eyes are large, the diameter of an orbit exceeding a fourth of the length of the head, and equalling the interorbital space. The upper jaw is triangular, longer than wide, and acutely rounded; the distance from the middle of its side to the orbit equals an orbit's diameter. The lower jaw, from the corner of the mouth to the tip, is more than a half greater than the length of the head, and forms a fourth of the *extreme* length. The dorsal fin commences between the sixth and seventh of

the length from the upper jaw to the end of the caudal, and is entirely over the anal. The pectorals, when bent forwards, reach at least to the centre of the pupil.

D 13, A 14, &c.

The general color is chocolate brown, with the usual lateral silver band broader between the dorsal and anal. A number of small purplish dots, and a few larger ones, form a triangular area on the occipital region, the apex of which is posterior, and the base emarginated; and from the angles of the base, two bands of spots proceed, and converge anteriorly. Above the orbit there is also a pale bluish area dotted with black.

A single specimen of this species, little more than four inches in length, is in the same collection. The color is much changed, or, at least, is quite distinct from that of most other species of the genus, but resembles more that of *Hemirhamphus Gernœrti* of Valenciennes.

It does not agree with the description of any of the known species of the genus. The H. Gernærti Val. appears to be its nearest ally, but the beak of that species is said to be the fifth of the total length, and no mention is made of any peculiarity in the coloration of the head. The H. intermedius of Cantor and Richardson differs in the number of rays, in color and in proportions. H. Sajori of Temminck and Schlegel is distinguished by its short beak. In H. japonicus of Brevoort, the anal appears to commence nearly under the middle of the dorsal, and the beak is also shorter. The present appears, therefore, to be undescribed.

LOPHOBRANCHII Cuv.

SYNGNATHOIDÆ Bon.

SOLEGNATHINÆ Gill.

17. Gasterotokeus biaculeatus Heckel.—This species, although widely distributed in the Eastern seas, and common on the Chinese coasts, has not been previously noticed as an inhabitant of Japan. Two specimens were obtained there by Dr. Morrow.

SYNGNATHINÆ Bon.

18. Syngnathus Schlegeli Kaup.

Sygnathus tenuirostris, Tem. and Schl. Fauna Japonica, Pisces, p. 273, pl. cxx. fig. 6, (non Rathke).

Sygnathus Schlegeli Kaup, catalogue Lophobranchii in British Museum, p. 46.

Two specimens of this species are also in the collection of Dr. Morrow.

The paper entitled "Observations upon the relations existing between Food, and the capabilities of men to resist low Temperatures, by I. I. Hayes, M. D.," was, on report of the Committee of the Biological Department, to which it had been referred, recommended to be published in a Medical Journal.

The following resolutions, presented by the Committee on Proceedings, were adopted:

Resolved, That the subscription to the Proceedings after the present year be increased to two dollars.

Resolved, That the Committee appointed to examine papers offered for publication in the Proceedings, be instructed, when it may be deemed expedient, to confer with the Committee on Proceedings, with a view to procure greater condensation of the material to be printed.

In accordance with the first of these resolutions, the recommendation of the Committee on Publication fund, fixing the price of commutation of subscription to the Proceedings at twenty-five dollars was concurred in.

The following was adopted:

Resolved, That the price of the volumes of Proceedings for 1857 and '58, already completed, and that for 1859 when completed, be uniform with that of the previously published volumes, (two dollars.)

May 3d.

Mr. LEA, President, in the Chair.

Thirty-eight members present.

Dr. Leidy called attention to a fragment of jaw of Mososaurus presented this evening, in which the tooth of succession was preserved in the cavity beneath the worn projecting tooth.

Dr. Carson exhibited some Chinese chemicals, and remarked specially upon a calomel in crystalline scales resembling boracic acid, which was formed by the empirical process of subliming a mixture of alum, common salt and mercury. It is quite free from corrosive sublimate.

May 10th.

Mr. LEA, President, in the Chair.

Forty-nine members present.

The following papers were presented for publication in the Proceedings:

Description of a third genus of Hemiramphinæ, by Theodore Gill.

Description of seven new species of Uniones, &c., by Isaac Lea.

And were referred to Committees.

Dr. R. E. Rogers, by request of the Academy, gave a lecture on the correlation of forces, illustrated with numerous experiments, showing the mutual convertiblity of different kinds of force.

The number of the Proceedings of the Academy for April was laid on the table.

May 17th.

Mr. LEA, President, in the Chair.

Forty-nine members present.

Dr. Leidy called attention to specimens of Palæotrochus presented this evening by Prof. E. Emmons, from subsilurian strata: he stated that its organic nature had been denied by able authorities, but considered that its symmetry and uniformity were in favor of its being a fossil; it had most strongly the appearance of a coral.

Dr. Le Conte had seen a similar body of larger size from the copper-bearing rocks of Point Keewenaw, Lake Superior. He could not conceive that such numbers of masses of similar form could arise from melecular action forming concretions.